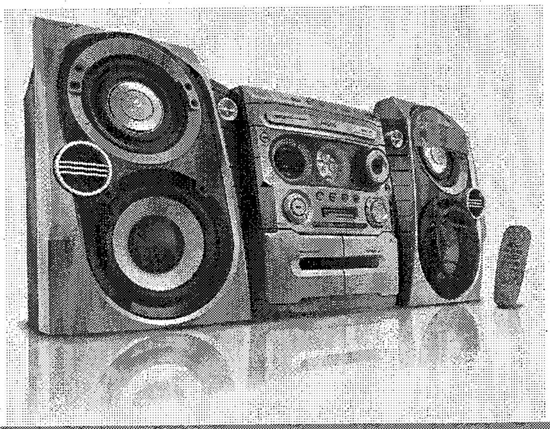
PHIL-05807

Mini System

FWM70/07/22

Service
Service
Service



Service Manual

COMPACT disc DIGITAL AUDIO ReWritable

COMPACT disc DIGITAL AUDIO Recordable

COMPACT disc DIGITAL AUDIO

MP3-CD PLAYBACK MP3

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CLASS 1
LASER PRODUCT

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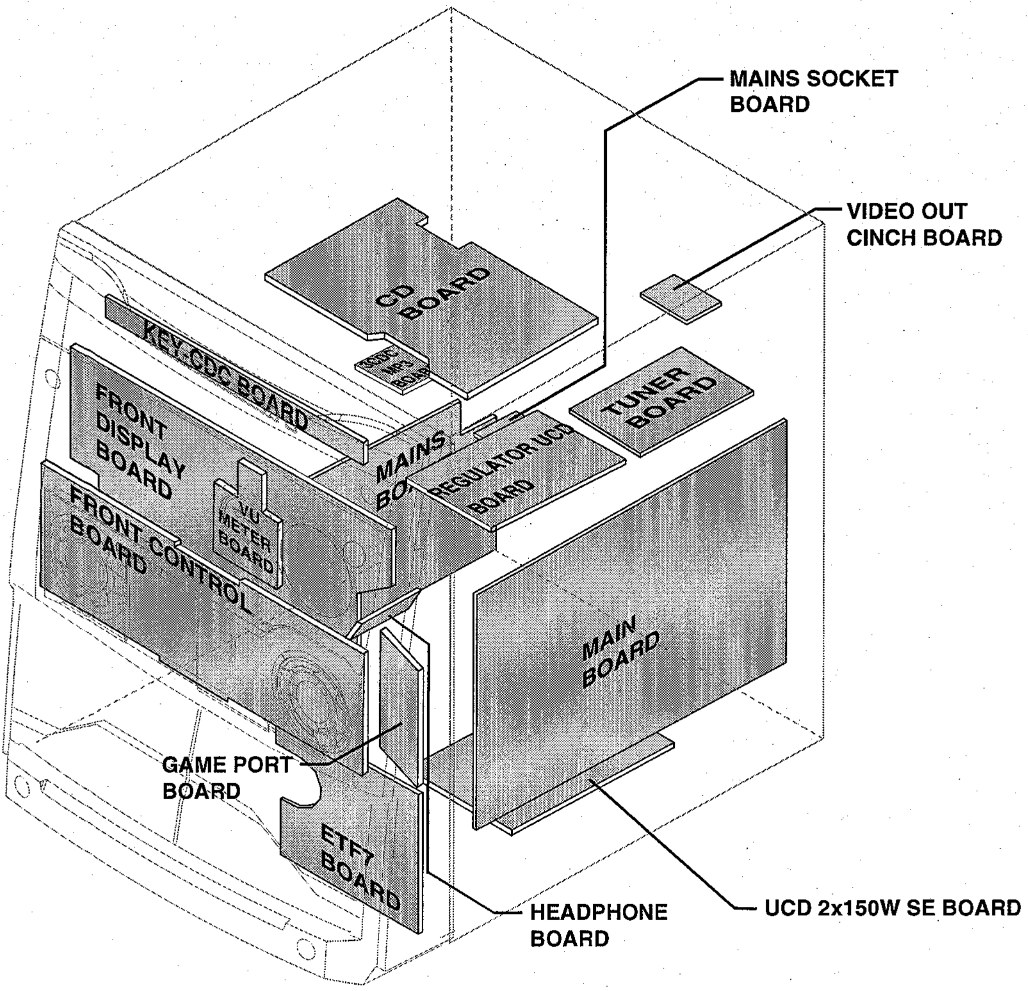
GB 3141 785 30181

Version 1.1

PHILIPS

LOCATION OF PRINTED CIRCUIT BOARDS


MAINS SOCKET BOARD
VIDEO OUT CINCH BOARD
CD BOARD
MP3
KEY-CDC BOARD
FRONT DISPLAY BOARD
VU METER BOARD
FRONT CONTROL BOARD
MAINS BO
REGULATOR UCD BOARD
TUNER BOARD
MAIN BOARD
GAME PORT BOARD
ETF7 BOARD
HEADPHONE BOARD
UCD 2x150W SE BOARD

VERSION VARIATIONS:

Type /Versions:	FWM70									
Features & Board in used:	/22	/07								
Aux in /CDR in	x	x								
Line Out	x	x								
Surround Out										
Subwoofer Out										
Video Out	x	x								
Matrix Surround										
CD Text										
Dolby B										
RDS	x									
Game Port (Video/Audio L/Audio R)	x	x								
Dolby Pro Logic (DPL)										
Incredible Surround	x	x								
Karaoke Features										
Voltage Selector										
ECO Power Standby (Clock Display Off)	x	x								
ECO6 Tuner Board - Systems Non-Cenelec		x								
ECO6 Tuner Board - Systems Cenelec	x									
Center/Surround Channel										
ETF7 ND/DD/FR - Chapter 9	x	x								
ETF7 DB/DD/FR - Chapter 9A										

SPECIFICATIONS

GENERAL:

Mains voltage : 230V ± 10% for /22
120V ± 10% for /07
Mains frequency : 50Hz
Power consumption : < 1W at ECO Power Standby
: 25W at Standby
: 110W at Active
Clock accuracy : < 4 seconds per day
Dimension centre unit : 265W x 322H x 390Dmm

TUNER:

FM

Tuning range : 87.5-108MHz
Grid : 50kHz
Grid : 100kHz for /37
IF frequency : 10.7MHz ± 25kHz
Aerial input : 75Ω coaxial
300Ω click fit for /37
Sensitivity at 26dB S/N : < 22 µV
Selectivity at 300kHz bandwidth : > 25dB
Image rejection : > 25dB [>75dB]
Distortion at RF=1mV, dev. 75kHz : < 3%
-3dB Limiting point : < 23.5µV
Crosstalk at RF=1mV, dev. 40kHz : > 18dB

MW

Tuning range : 531-1602kHz
530-1700kHz for /07
Grid : 9kHz
10kHz for /07
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : < 4.0mV/M
Selectivity at 300kHz bandwidth : > 18dB
IF rejection : > 45dB
Image rejection : > 28dB
Distortion at RF=50mV, m=80% : < 5%

AMPLIFIER:

Output power (4Ω, 1kHz, 10% THD)
L & R : 2 x 110W RMS /22
: 2 x 88W FTC /07
Frequency response within -3dB : 50Hz-20kHz
Incredible Surround : ON/OFF
WOOX : Level 1, 2, 3 & OFF
Digital Sound Control (DSC) : Digital, Rock, Pop, Newage, Classic, Electric
Virtual Ambience Control (VAC) : Hall, Concert, Cinema, Disco, Arcade, Cyber

Game Sound : Speed /Punch /Blast /Off
Input sensitivity
Aux in : 640mV ± 2dB at 1kHz
CDR in : 1V ± 3dB at 1kHz
Game Port (at 1kHz) : 310mV ± 2d
Output sensitivity
Line out (Left/Right) : 550mV ± 2dB at 22kΩ
Headphone output at 32!& 700mV± 2dB (Max. vol.)

CASSETTE RECORDER:

Number of track : 2 x 2 stereo
Tape speed : 4.76 cm/sec ± 2%
Wow and flutter : < 0.4% DIN
Fast-wind/Rewind time C60 : 130 sec
Bias system : 78kHz ± 10kHz
Rec/Pb frequency response within 10dB : 125Hz - 8kHz
Signal to Noise Ratio (Type I) : > 48dBA

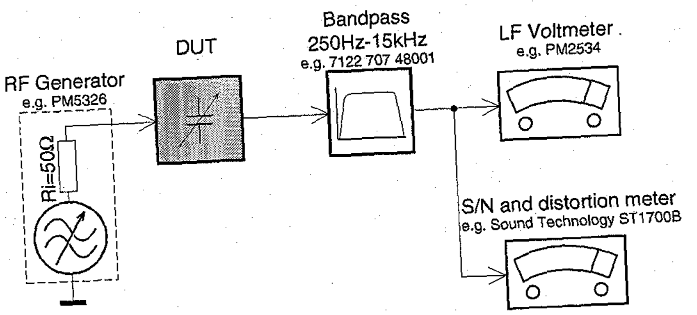
COMPACT DISC:

Measurement done at output conn. of the CDC module.
Frequency response : < ±3dB for 20Hz-20kHz
Output Voltage (in Vrms) : 0.65Vrms ± 1dB unloaded
Signal to Noise Ratio (A-weighted) : > 80dBA
Distortion at 1kHz : < 0.003%
Channel Unbalance : < ±1dB
Channel Separation (1kHz) : >60dB
De-emphasis : 0 or 15/50mS (Switched by subcode on the disc)
MPEG 1 Layer 3 (MP3-CD) : MPEG AUDIO
MP3-CD Bit Rate : 56-256 kbps
MP3-CD Sampling Frequencies : 32 kHz, 44.1 kHz, 48kHz
Recording Format : ISO 9660
UDF format not supported

[....] Values indicated are for "ECO6 Cenelec Board" only.

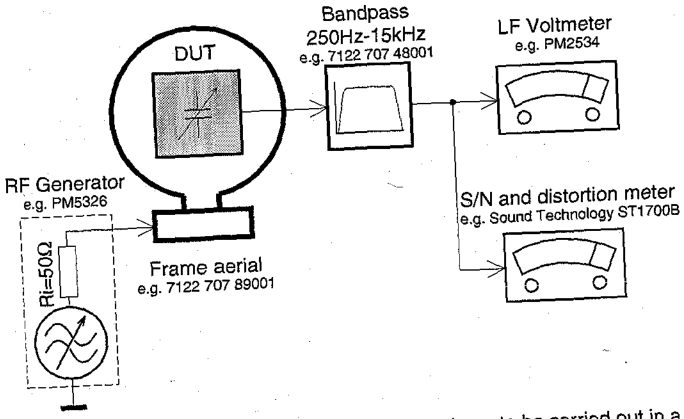
MEASUREMENT SETUP

Tuner FM


DUT
Bandpass
250Hz-15kHz
e.g. 7122 707 48001
LF Voltmeter
e.g. PM2534
RF Generator
e.g. PM5326
Ri=50Ω
S/N and distortion meter
e.g. Sound Technology ST1700B

Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilottone (19kHz, 38kHz).

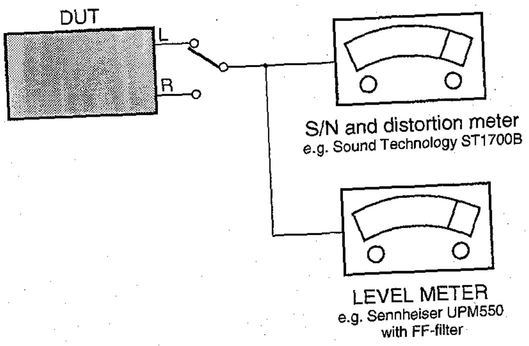
Tuner AM (MW,LW)


DUT
Bandpass
250Hz-15kHz
e.g. 7122 707 48001
LF Voltmeter
e.g. PM2534
RF Generator
e.g. PM5326
Ri=50Ω
Frame aerial
e.g. 7122 707 89001
S/N and distortion meter
e.g. Sound Technology ST1700B

To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday´s cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

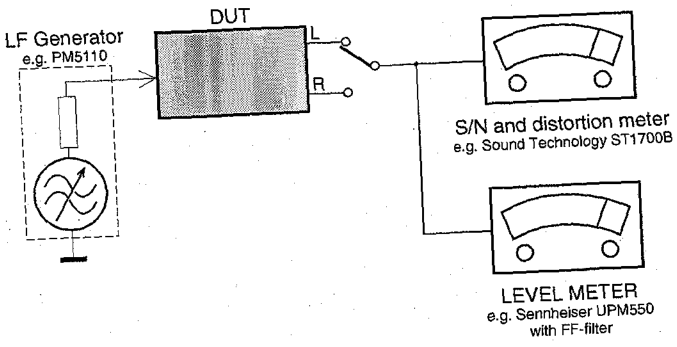
CD

Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)


DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

Recorder

Use Universal Test Cassette **CrO2** SBC419 4822 397 30069
or Universal Test Cassette **Fe** SBC420 4822 397 30071


DUT
LF Generator
e.g. PM5110
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

SERVICE AIDS

Service Tools:

Universal Torx driver holder	4822 395 91019
Torx bit T10 150mm	4822 395 50456
Torx driver set T6 - T20	4822 395 50145
Torx driver T10 extended	4822 395 50423

Cassette:

SBC419 Test cassette CrO2	4822 397 30069
SBC420 Test cassette Fe	4822 397 30071
MTT150 Dolby level 200nWb/M	4822 397 30271

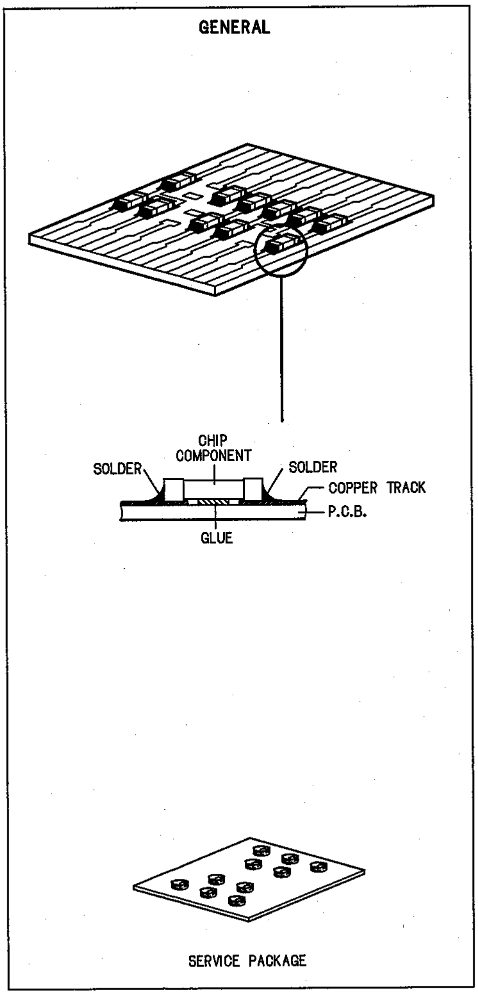
Compact Disc:

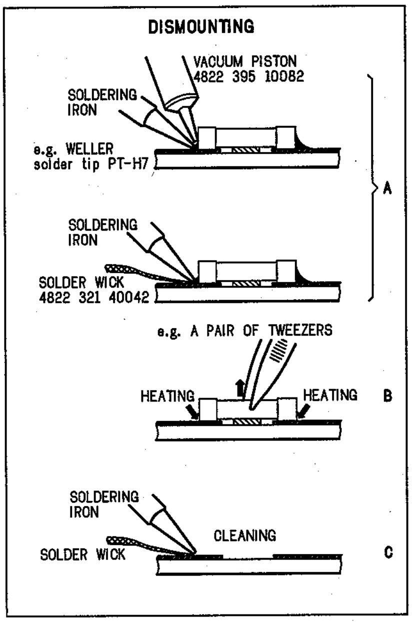
SBC426/426A Test disc 5 + 5A	4822 397 30096
SBC442 Audio Burn-in Test disc 1kHz	4822 397 30155
SBC429 Audio Signals disc	4822 397 30184
Dolby Pro-logic Test Disc	4822 395 10216

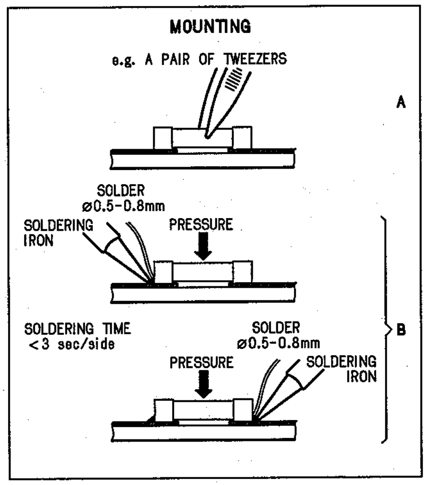
ESD Equipment:

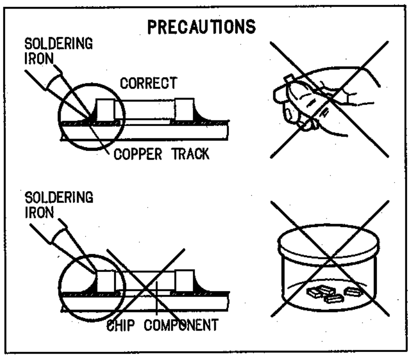
Anti-static table mat - large 1200x650x1.25mm	4822 466 10953
Anti-static table mat - small 600x650x1.25mm	4822 466 10958
Anti-static wristband	4822 395 10223
Connector box (1MΩ)	4822 320 11307
Extension cable (to connect wristband to conn. box)	4822 320 11305
Connecting cable (to connect table mat to conn. box)	4822 320 11306
Earth cable (to connect product to mat or box)	4822 320 11308
Complete kit ESD3 (combining all above products)	4822 320 10671
Wristband tester	4822 344 13999

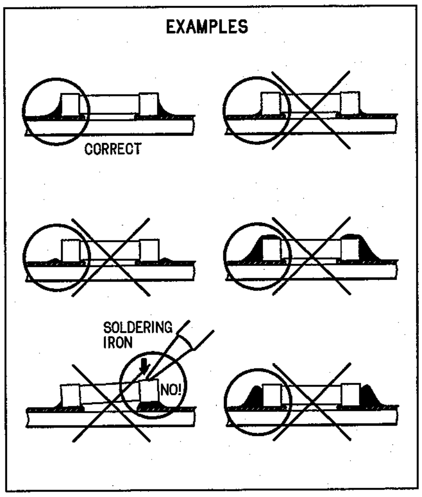
HANDLING CHIP COMPONENTS


GENERAL
CHIP COMPONENT
SOLDER
SOLDER
COPPER TRACK
P.C.B.
GLUE
SERVICE PACKAGE


DISMOUNTING
VACUUM PISTON
4822 395 10082
SOLDERING IRON
e.g. WELLER solder tip PT-H7
A
SOLDERING IRON
SOLDER WICK
4822 321 40042
e.g. A PAIR OF TWEEZERS
HEATING
HEATING
B
SOLDERING IRON
CLEANING
SOLDER WICK
C


MOUNTING
e.g. A PAIR OF TWEEZERS
A
SOLDER
ø0.5-0.8mm
SOLDERING IRON
PRESSURE
SOLDERING TIME
<3 sec/side
SOLDER
ø0.5-0.8mm
PRESSURE
SOLDERING IRON
B


PRECAUTIONS
SOLDERING IRON
CORRECT
COPPER TRACK
SOLDERING IRON
CHIP COMPONENT


EXAMPLES
CORRECT
SOLDERING IRON
NO!

(GB) WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD).
Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.
Keep components and tools also at this potential.

(F) ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

ESD

(D) WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

(NL) WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

(GB)

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used

Safety components are marked by the symbol ⚠.

(NL)

Veiligheidsbepalingen vereisen, dat het apparaat bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

De Veiligheidsonderdelen zijn aangeduid met het symbool ⚠

(F)

Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utiliséés les piéces de rechange identiques à celles spécifiées.

Less composants de sécurité sont marqués ⚠

(D)

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Original zustand des Geräts darf nicht verändert werden; für Reparaturen sind Original-Ersatzteile zu verwenden.

Sicherheitsbauteile sind durch das Symbol ⚠ markiert.

(I)

Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

Componenty di sicurezza sono marcati con ⚠

(GB)

After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazard exist. The leakage current must not exceed 0.5mA.

CLASS 1
LASER PRODUCT

(GB) Warning !

Invisible laser radiation when open.
Avoid direct exposure to beam.

(S) Varning !

Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

(SF) Varoitus !

Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

(DK) Advarse !

Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

(F)

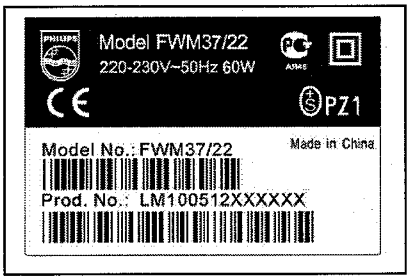
"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

INFORMATION ABOUT LEAD-FREE SOLDERING

Philips CE is producing lead-free sets from 1.1.2005 onwards.
IDENTIFICATION:

Regardless of special logo (not always indicated) one must treat all sets from 1 Jan 2005 onwards, according next rules:

Example S/N:



PHILIPS
Model FWM37/22
220-230V~50Hz 60W
PZ1
Model No.: FWM37/22
Made in China
Prod. No.: LM100512XXXXXX

Bottom line of typeplate gives a 14-digit S/N. Digit 5&6 is the year, digit 7&8 is the week number, so in this case 2005 wk12

So from 0501 onwards = from 1 Jan 2005 onwards

***Important note:* In fact also products of year 2004 must be treated in this way as long as you avoid mixing solder-alloys (leaded/ lead-free). So best to always use SAC305 and the higher temperatures belong to this.**

Due to lead-free technology some rules have to be respected by the workshop during a repair:

- Use only lead-free solder alloy Philips SAC305 with order code 0622 149 00106. If lead-free solder-paste is required, please contact the manufacturer of your solder-equipment. In general use of solder-paste within workshops should be avoided because paste is not easy to store and to handle.
- Use only adequate solder tools applicable for lead-free solder alloy. The solder tool must be able
  - To reach at least a solder-temperature of 400°C,
  - To stabilize the adjusted temperature at the solder-tip
  - To exchange solder-tips for different applications.
- Adjust your solder tool so that a temperature around 360°C – 380°C is reached and stabilized at the solder joint. Heating-time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400°C otherwise wear-out of tips will rise drastically and flux-fluid will be destroyed. To avoid wear-out of tips switch off un-used equipment, or reduce heat.
- Mix of lead-free solder alloy / parts with leaded solder alloy / parts is possible but PHILIPS recommends strongly to avoid mixed solder alloy types (leaded and lead-free).
  If one cannot avoid or does not know whether product is lead-free, clean carefully the solder-joint from old solder alloy and re-solder with new solder alloy (SAC305).
- Use only original spare-parts listed in the Service-Manuals. Not listed standard-material (commodities) has to be purchased at external companies.
- Special information for BGA-ICs:
  - always use the 12nc-recognizable soldering temperature profile of the specific BGA (for de-soldering always use the lead-free temperature profile, in case of doubt)
  - lead free BGA-ICs will be delivered in so-called 'dry-packaging' (sealed pack including a silica gel pack) to protect the IC against moisture. After opening, dependent of MSL-level seen on indicator-label in the bag, the BGA-IC possibly still has to be baked dry. (MSL=Moisture Sensitivity Level). This will be communicated via AYS-website.
  Do not re-use BGAs at all.
- For sets produced before 1.1.2005 (except products of 2004), containing leaded solder-alloy and components, all needed spare-parts will be available till the end of the service-period. For repair of such sets nothing changes.
- On our website **www.atyourservice.ce.Philips.com** you find more information to:
  - BGA-de-/soldering (+ baking instructions)
  - Heating-profiles of BGAs and other ICs used in Philips-sets

  You will find this and more technical information within the "magazine", chapter "workshop news".

For additional questions please contact your local repair-helpdesk.

SERVICE INSTRUCTION

Safety regulations require that after a repair, the set must be returned in its original condition. Pay in particular attention to the following points:

- Route the wire trees correctly and fix them with the mounted cable clamps.
- Check the insulation of the AC Power lead for external damage.
- Check the strain relief of the AC Power cord for proper function.
- Check the electrical DC resistance between the AC Power Plug and the secondary side (only for sets which have a AC Power isolated power supply):

1. Unplug the AC Power cord and connect a wire between the two pins of the AC Power plug.
2. Set the AC Power switch to the "on" position (keep the AC Power cord unplugged!).
3. Measure the resistance value between the pins of the AC Power plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be larger than 4.5 Mohm (For U.S. it should be between 4.2 Mohm and 12 Mohm).
4. Switch "off" the set, and remove the wire between the two pins of the AC Power plug.

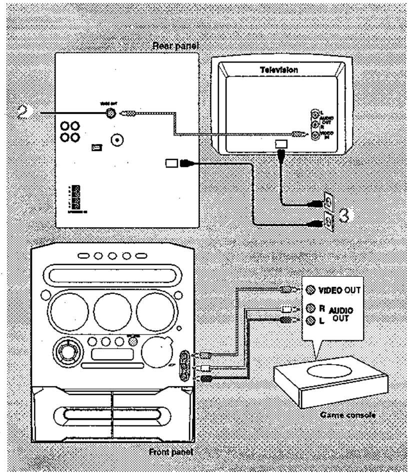
- Check the cabinet for defects, to avoid touching of any inner parts by the customer.

Gameport Operations

About Gameport

Gameport allows you to connect your game console to this audio system which enables you to enjoy a total game immersion experience through powerful sound output.

Preparation before use



1 Connect your game console's video and audio output to the GAMEPORT video and audio inputs respectively (refer to "**Connections - Connecting to game console**).

2 Connect your TV's video input to the **VIDEO OUT** (**CVBS**) on the rear panel.

3 Connect all the AC power cord to the power outlet.

Starting operation

4 Turn on the TV and set to the correct video-in channel.
The TV's video input channel may be called AUX(iliary) IN, AUDIO/VIDEO (A/V) IN, EXT 1, etc. These channels are often near channel 00 on your TV. Or, your TV remote control may have a button or switch that chooses different video modes. See your TV manual for details.

5 Press **AUX•GAME** until "GAMEPORT" is display.

6 Press **GAME** to select the type of sound setting that best suit the game : SPEED, PUNCH, BLAST or OFF.

7 If you like to mix your game sound to your favourite music, press **MIX-IT** to select the desired music source : CD, TUNER, AUX, TAPE or OFF.
CD → "MIX-CD"
TUNER → "MIX-TU"
AUX → "MIX-AUX"
TAPE → "MIX-TA1"/"MIX-TA2"
OFF → "MIX-OFF"

Note:
– To change the disc tray, you have to press CD, then press CD 1~3 to select the desired disc tray.

8 If necessary, start playback of your chosen mixer source.

9 Start playing your favourite game.

To adjust the game console's volume level

Adjust **GAME VOLUME**.

Notes:
– You can only activate GAME VOLUME and MIX-IT while in the game source mode.
– If your game console is switched on, the video image will always appear on the TV even though you are not in the gameport mode.

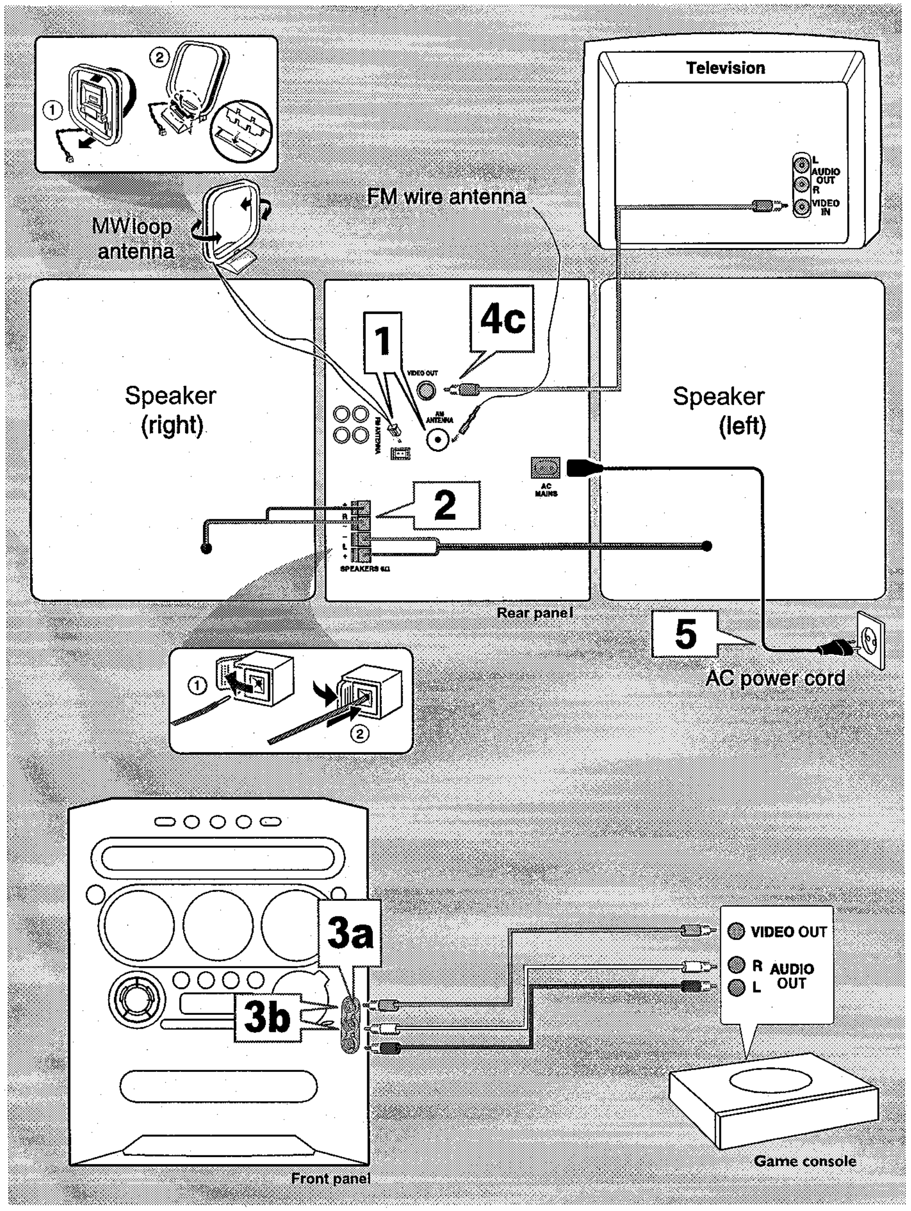
Troubleshooting

WARNING
Under no circumstances should you try to repair the system yourself, as this will invalidate the warranty. Do not open the system as there is a risk of electric shock.

If a fault occurs, first check the points listed below before taking the system for repair. If you are unable to remedy a problem by following these hints, consult your dealer or Philips for help.

Problem	Solution
Radio reception is poor.	If the signal is too weak, adjust the antenna or connect an external antenna for better reception. Increase the distance between the system and your TV or VCR.
"NO DISC" is displayed or the disc cannot be played.	Insert a disc. Load in the disc with the labeled side facing up. Replace or clean the disc, see "Care and safety information". Use a finalised CD-R(W) or a correct format disc.
The system does not react when buttons are pressed.	Remove and reconnect the AC power cord and switch on the system again.
Sound cannot be heard or is of poor quality.	Adjust the volume. Disconnect the headphones. Check that the speakers are connected correctly. Check that the AC power cord is connected properly.
The remote control does not function properly.	Select the source (CD or TUNER, for example) before pressing the function button (▶II, I◀◀, ▶▶I). Reduce the distance between the remote control and the system. Replace the battery. Point the remote control directly toward the IR sensor.
The timer is not working.	Set the clock correctly. Press TIMER ON/OFF to switch on the timer.
The system displays features automatically and buttons start flashing.	Press and hold DEMO STOP on the main unit to switch off the demonstration mode.

Refer to the FAQ (Frequently Asked Questions) on the supplied CD-ROM or visit our website "www.audio.philips.com" for latest update on FAQ.



Warning!
– Use only the supplied speakers. The combination of the main unit and speakers provides the best sound. Using other speakers can damage the unit and sound quality will be negatively affected.
– Never make or change connections with the power switched on.
– Connect the AC power cord to the power outlet only after you have finished hooking up everything.
– To avoid overheating of the system, a safety circuit has been built in. Therefore, your system may switch to Standby mode automatically under extreme conditions. If this happens, let the system cool down before reusing it *(not available for all versions).*

Step 1: Connecting FM/MW antennas

– Place the MW loop antenna on a shelf or attach it to a stand or wall.
– Extend the FM antenna and fix its ends to the wall.
– Adjust the position of the antennas for optimal reception.
– Position the antennas as far as possible from a TV, VCR or other radiation source to prevent unwanted noise.
– For better FM stereo reception, connect the external FM antenna.

Step 2: Connecting the speakers

Connect the speaker wires to the SPEAKERS terminals, right speaker to "R" and left speaker to "L", coloured (marked) wire to " + " and black (unmarked) wire to " – ". Fully insert the stripped portion of the speaker wire into the terminal as shown on page 10.

Notes:
– Ensure that the speaker cables are correctly connected. Improper connections may damage the system due to short-circuit.
– Do not connect more than one speaker to any one pair of +/- speaker terminals.

Step 3: Connecting to the game console

IMPORTANT!
Gameport inputs are for the game console only.

a. Use the game console's video cable (not supplied) to connect its video output to the GAMEPORT-**VIDEO** terminal.

b. Use the game console's audio cables (not supplied) to connect its audio outputs to the GAMEPORT-**AUDIO L. / AUDIO R.** terminals.

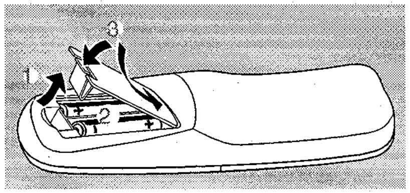
c. Use the video cable (yellow) to connect the **VIDEO OUT** terminal to the video input on the TV for viewing.

Notes:
– On the TV, the Video Input jack is usually yellow and might be labeled A/V In, CVBS, Composite or Baseband.
– To avoid magnetic interference, do not position the front speakers too close to your TV.

Step 4: Connecting the AC power cord

"AUTO INSTALL - PRESS PLAY" may appear on the display panel when the AC power cord is plugged into the power outlet for the first time. Press ▶II on the main unit to store all available radio stations *(page 3 - P3)* or press ■ to exit (refer to "Tuner Operations").

Step 5: Inserting batteries into the remote control



1 Open the battery compartment cover.

2 Insert two batteries type R06 or AA, following the indications (+/−) inside the compartment.

3 Close the cover.

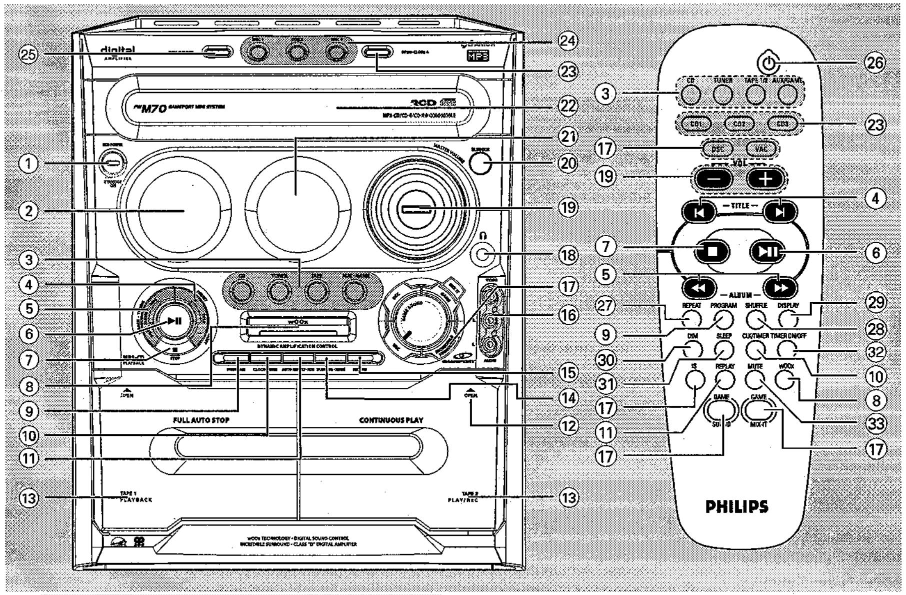
Using the remote control to operate the system

1 Aim the remote control directly at the remote sensor (iR) on the main unit.

2 Select the source you wish to control by pressing one of the source select keys on the remote control (for example CD,TUNER).

3 Then select the desired function (for example ▶II, I◀, ▶I).

CAUTION!
– Remove batteries if they are exhausted or will not be used for a long time.
– Do not use old and new or different types of batteries in combination.
– Batteries contain chemical substances, so they should be disposed of properly.



Main unit and remote control

① **STANDBY ON ⏻ / ECO POWER**
- Switches to the Eco Power standby mode or turns on the system.
- *Switches to the standby mode.

② **Display screen**

③ **CD / TUNER / TAPE(TAPE1/2) / AUX•GAME**
- Selects the relevant active mode.
- CD: toggles between DISC 1~3.
- TUNER: toggles between FM and MW band.
- AUX•GAME: toggles between AUX and GAMEPORT mode.
- TAPE: toggles between Tape Deck 1 and Tape Deck 2.

④ **PRESET (–) (⏮) PRESET (+) (⏭)**
- CD: selects a track or selects a title from MP3 disc.
- TUNER: selects a preset radio station.
- CLOCK: sets the minutes.

⑤ **SEARCH•TUNING•ALBUM ⏮ / ⏭ (◀◀ / ▶▶)**
- CD: *searches backward/forward.
- MP3-CD: select an album
- TUNER: tunes the radio frequency up/down.
- CLOCK: sets the hours.
- TAPE: searches backward/forward.

⑥ **PLAY•PAUSE ▶II**
- CD: starts/pauses playback.
- TAPE: starts playback. *(only on the main unit)*
- TUNER: *enters Plug & Play mode and/or starts preset radio station installation.

⑦ **STOP ■**
- Exits an operation.
- CD: stops playback or clears a programme.
- TUNER: *erases a preset radio station. *(only on the main unit)*
- *Turns on/off the demonstration mode.

⑧ **wOOx**
- Selects the enhanced or normal wOOx sound effect.

⑨ **PROGRAM**
- CD: starts or confirms tracks programming.
- TUNER: starts *automatic/manual preset

*** = Press and hold the button for more than two seconds.***

⑩ **CLOCK•TIMER (CLK/TIMER)**
- *Enters clock or timer setting mode.

⑪ **AUTO REPLAY•RDS**
- Selects continuous playback in either AUTO PLAY or ONCE mode only.
- Selects RDS information in the TUNER mode.

⑫ **OPEN ▲**
- Opens the tape deck

⑬ **TAPE1 / TAPE2**
- Tape deck 1 and tape deck 2.

⑭ **DUBBING•NEWS**
- Dubs a tape
- *Turns on/off news.

⑮ **RECORD**
- Starts recording on tape deck 2

⑯ **VIDEO**
- Use a video cable to connect to your game console's video output.

AUDIO L. / AUDIO R.
- Use an audio cable to connect to your game console's left/right audio output.

⑰ **INCREDIBLE SURROUND**
- Creates a super-enhanced stereo effect.

DSC
- Selects different type of preset sound equaliser settings (NEW AGE, ELECTRIC, DIGITAL, POP, CLASSIC or ROCK.).

VAC
- Selects different type of ambience-based equaliser settings (CINEMA, ARCADE, CONCERT, DISCO, CYBER or HALL).

MIX IT (GAME MIX IT)
- Mixes the game sound with your favourite music from one of these music sources (CD, TUNER or AUX).

GAME SOUND
- Adjusts the game's output volume level.
- Selects different type of equaliser setting for Gameport (SPEED, PUNCH or BLAST).

⑱ 🎧
- Plugs in the headphones jack. The speakers output will be cancelled.

⑲ **MASTER VOLUME (VOL + –)**
- Adjusts the volume level.

⑳ **iR SENSOR**
- Points the remote control towards this sensor.

㉑ **VU meters**
- Indicates signal strength of left/right channel.

㉒ **DISC TRAY**

㉓ **OPEN•CLOSE ≜ (DISC 1~3)**
- Opens/closes the respective disc tray.

㉔ **DISC 1, 2 and 3**
- Selects a disc tray to playback

㉕ **DISC CHANGE**
- Changes discs

Control buttons available on the remote control only

㉖ ⏻
- Switches to the Eco Power standby mode.
- *Switches to the standby mode.

㉗ **REPEAT**
- Repeats a track/disc/all programmed tracks.

㉘ **SHUFFLE**
- Turns on/off the random play mode.

㉙ **DISPLAY**
- Displays the album and title name for MP3 disc.

㉚ **DIM**
- Turns on/off the dim mode.

㉛ **SLEEP**
- Sets the sleep timer function.

㉜ **TIMER ON/OFF**
- Turns on/off the timer function.

㉝ **MUTE**
- Mutes or restores the volume

*** = Press and hold the button for more than two seconds.***

DISMANTLING INSTRUCTIONS

Dismantling of the Cassette Cover

Lift up and out

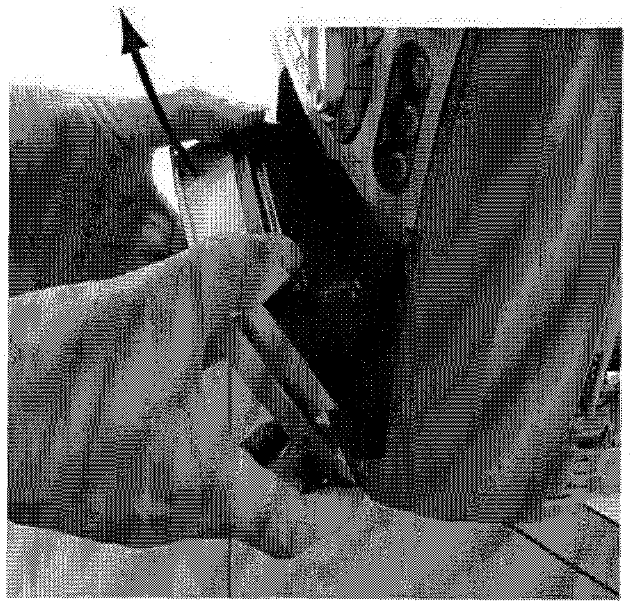


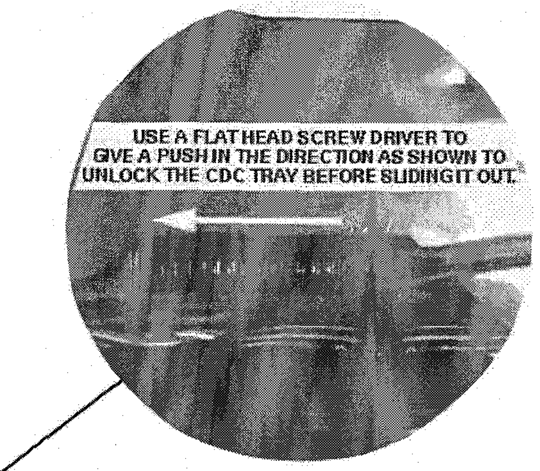
Figure 1

Remove Cassette Cover

Cassette Cover

Dismantling of the CDC Module and Front Panel

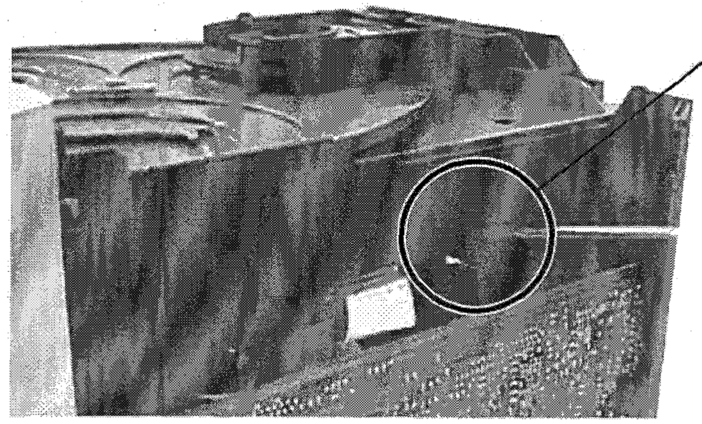
1) Loosen 4 screws to remove the Cover Top (pos 255) of the set.
2) Loosen 2 screws to remove the Panel Left (pos 253) and 2 screws to remove the Panel Right (pos 254) of the set.
3) Slide out the CDC Tray as shown in the diagram below with the help of a flat head screw driver.


USE A FLAT HEAD SCREW DRIVER TO GIVE A PUSH IN THE DIRECTION AS SHOWN TO UNLOCK THE CDC TRAY BEFORE SLIDING IT OUT.

Sliding out the CDC Tray

Figure 3

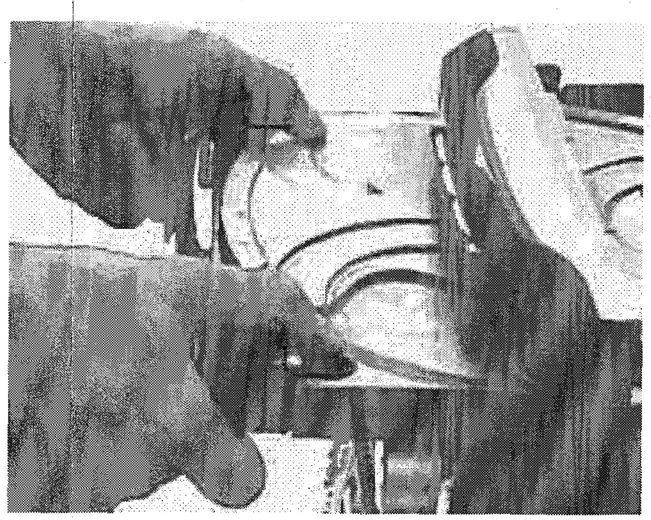
Figure 2



Dismantling of the CDC Module and Front Panel

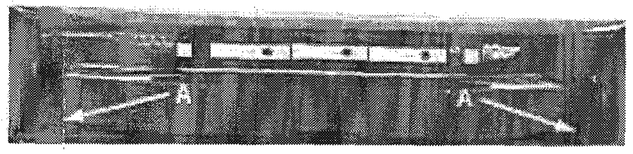
4) Remove the Cover Tray CDC as indicated.

Figure 4



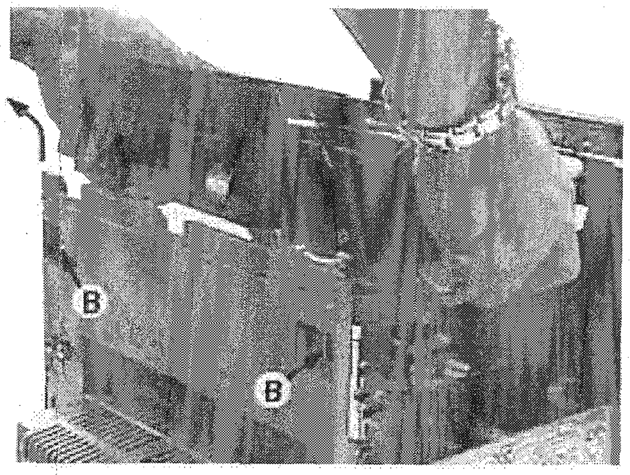
Remove Cover Tray CDC

5) Loosen 2 screws A and 2 screws B to remove the CDC Module as indicated.
6) Remove 2 screws at the bottom to separate the Front Panel Assembly from the Plate Bottom.



Front View CDC

Figure 5



Remove CDC Module

Figure 6

DISMANTLING INSTRUCTIONS

Detaching the Front Panel assembly from the Bottom/Rear assembly

1) Remove 2 screws B as shown in Figure 8 from the bottom of the Cabinet Front .
2) Release the fixation of the AF Board to Bracket CDC Right by releasing the 2 catches C1 (see Figure 9) and pulling the AF Board outwards as shown in Figure 8.
3) Uncatch 2 catches C2 (see Figure 9) on the left & right sides of the Cabinet Front and slides the Front Panel assembly out towards the front.

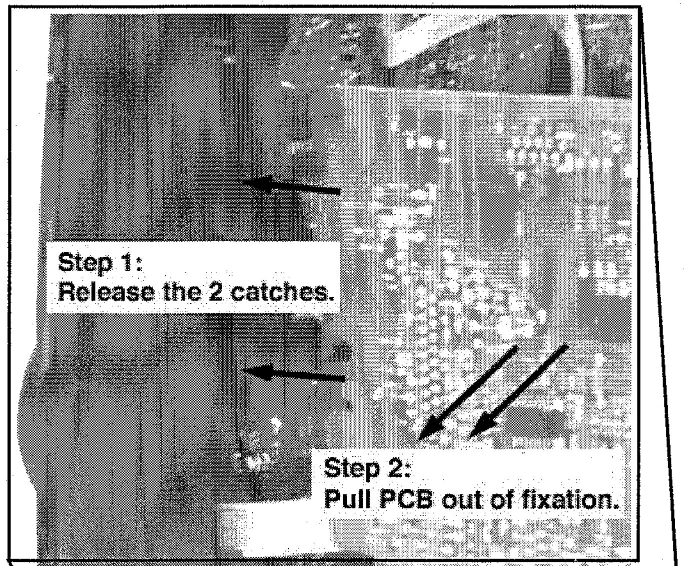


Figure 8

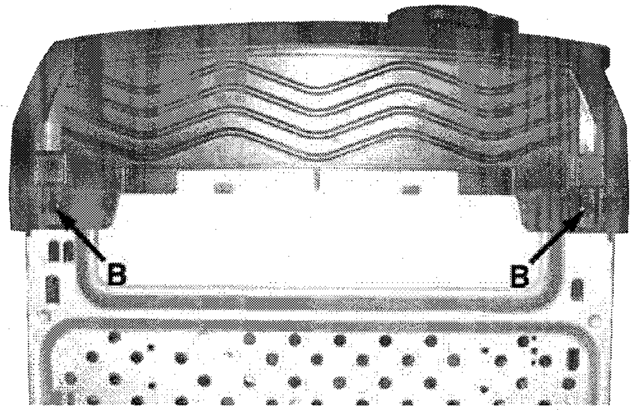


Figure 7

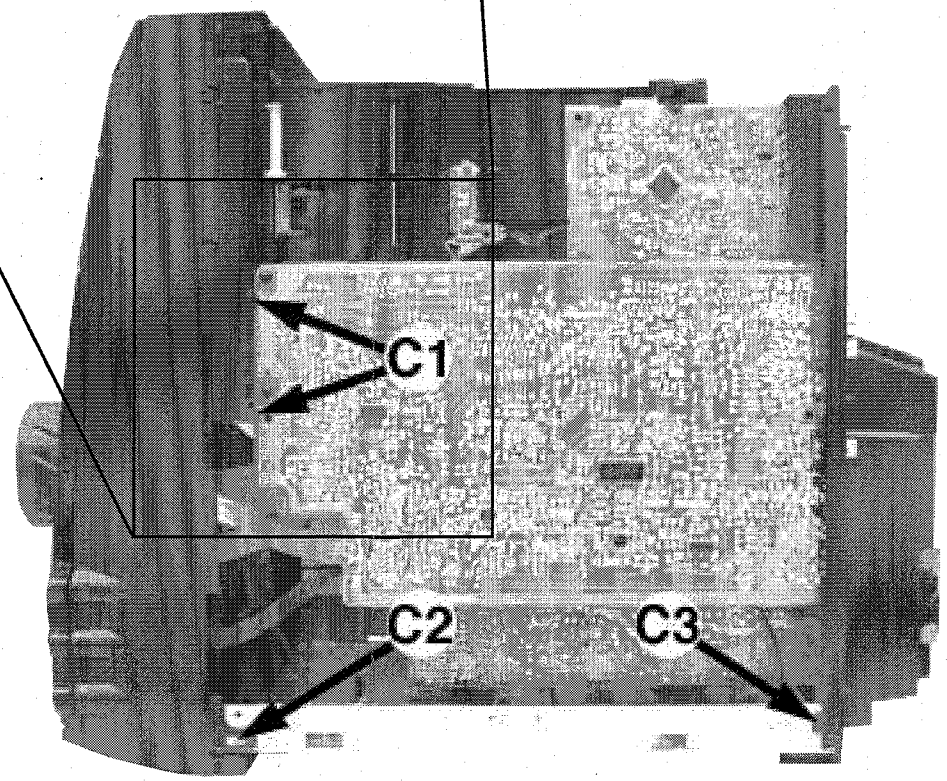


Figure 9

Dismantling of the Front Control Board and Front Display Board

1) The Knob Volume Rotary can be remove by pulling it out in the direction as shown in Figure 10.
2) The Knob Jog Rotary can be remove by inserting a strong string into the slot and pull it in the direction as shown in Figure 11.

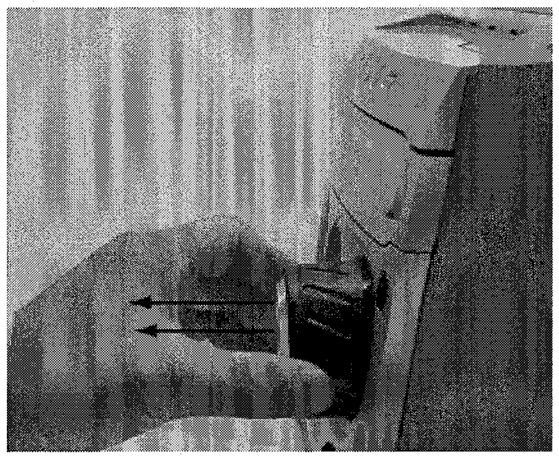


Figure 10

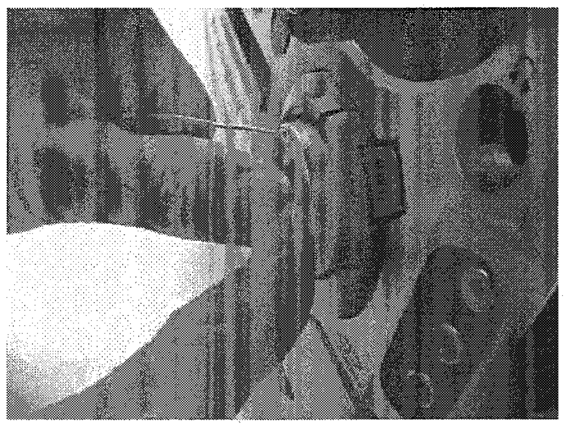


Figure 11

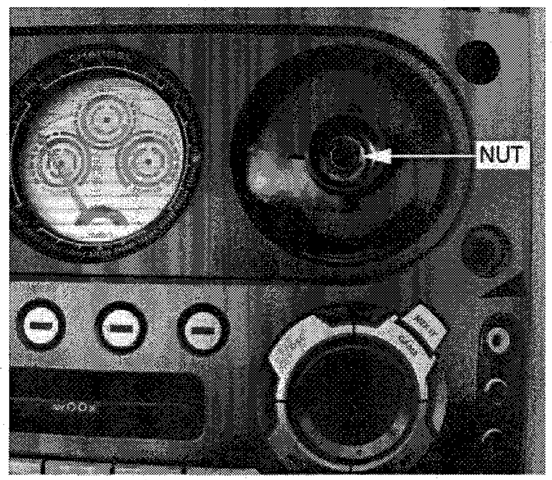


Figure 12

3) Loosen 2 nuts (see Figure 12) to remove the Front Display Board.
4) Loosen 8 screws D (see Figure 13) to remove the Front Display Board.

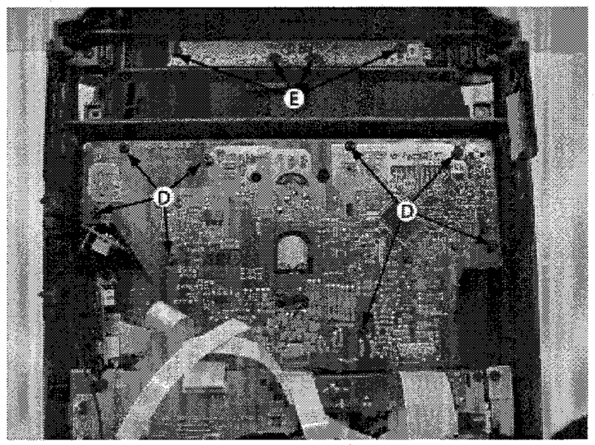


Figure 13

5) Loosen 4 screws E (see Figure 13) to remove the CDC Key Board.

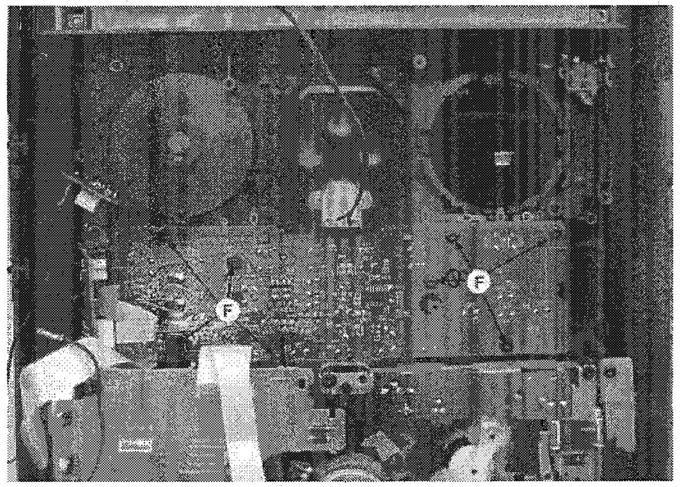


Figure 14

6) Loosen 8 screws F (see Figure 14) to remove the Front Control Board .
7) Loosen 3 screws G (see Figure 15) to remove the Headphone Board and Game Port Board.

DISMANTLING INSTRUCTIONS

Dismantling of the Game Port Board and Headphone Board

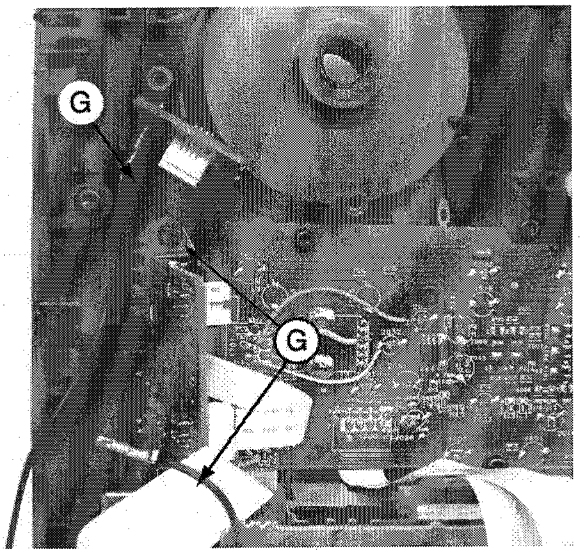


Figure 15

Dismantling of the ETF Tape Module

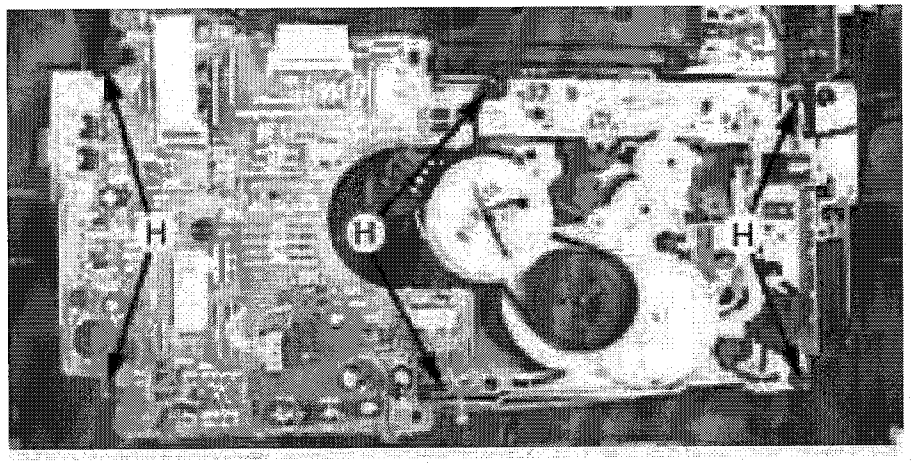


Figure 16

1) Loosen 6 screws H (see Figure 16) to remove the ETF Tape Module.

Dismantling of Rear Portion

1) Remove 2 screws I (see Figure 17) to loose the AF12 Board.

2) Loosen 3 screws J and uncatch N (see Figure 17) to remove the Tuner Board.

3) Loosen 1 screws K (see Figure 17) to remove the Video Board.

4) Loosen 4 screws L (see Figure 17) and uncatch C5 (see Figure 18) to remove the Fan.

5) Loosen3 screws M (see Figure 17) and uncatch C3 (see Figure 9) to remove the Panel Rear by sliding it out towards the rear.

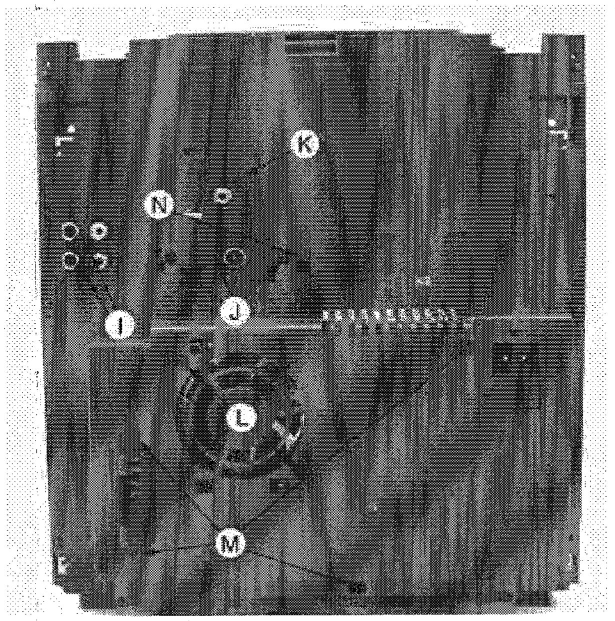


Figure 17

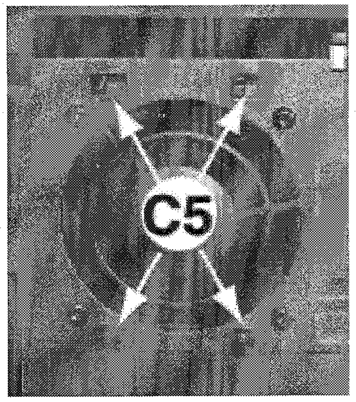


Figure 18

Repair Hint

1) During repair it is possible to disconnect the Tuner Board and CDC Module completely unless the fault is suspected to be in that area. This will not affect the performance of the rest of the set.

2) Due to the short flex cable wires in the ETF Module, the PCB should be disconnected and reconnected on the reverse side of the tape mechanism to keep it electrically connected during repair. see Figure 19.

Note: The flex cables are very fragile, care should be taken not to damage them during repair. After repair, be very sure that the flex cables are inserted properly into the flex sockets before encasing, otherwise faults may occurs.

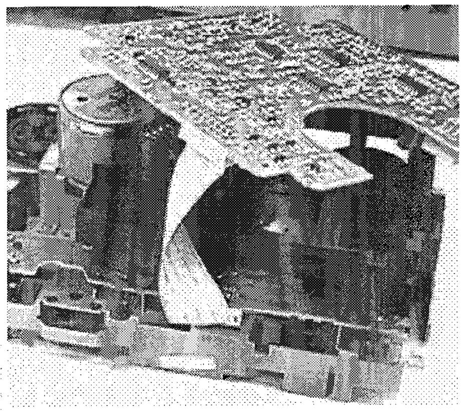
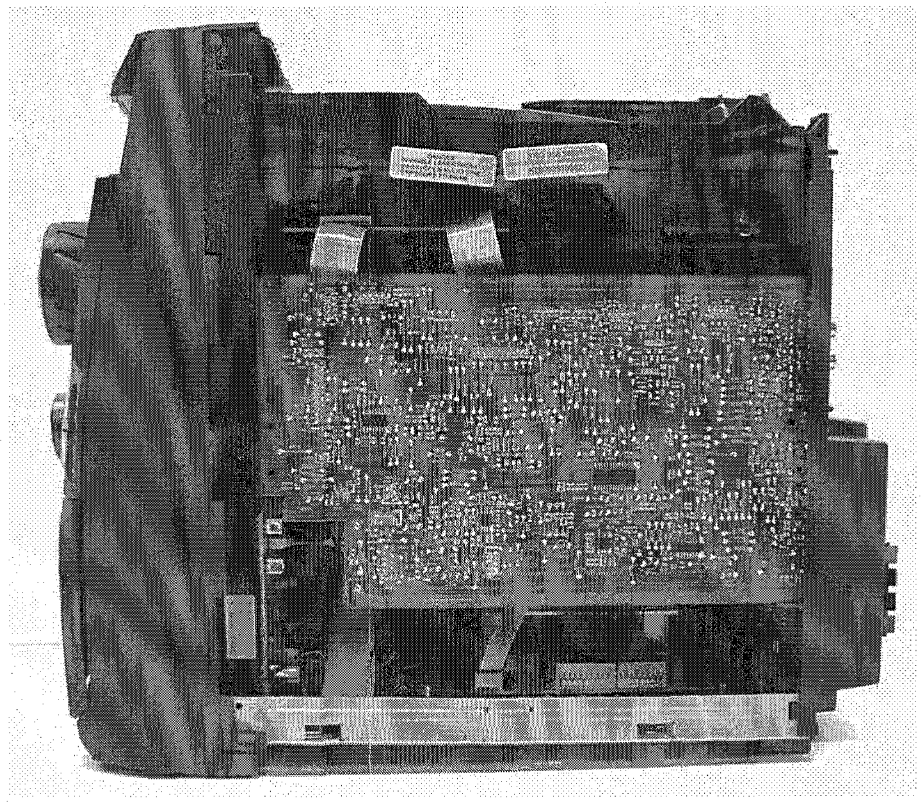
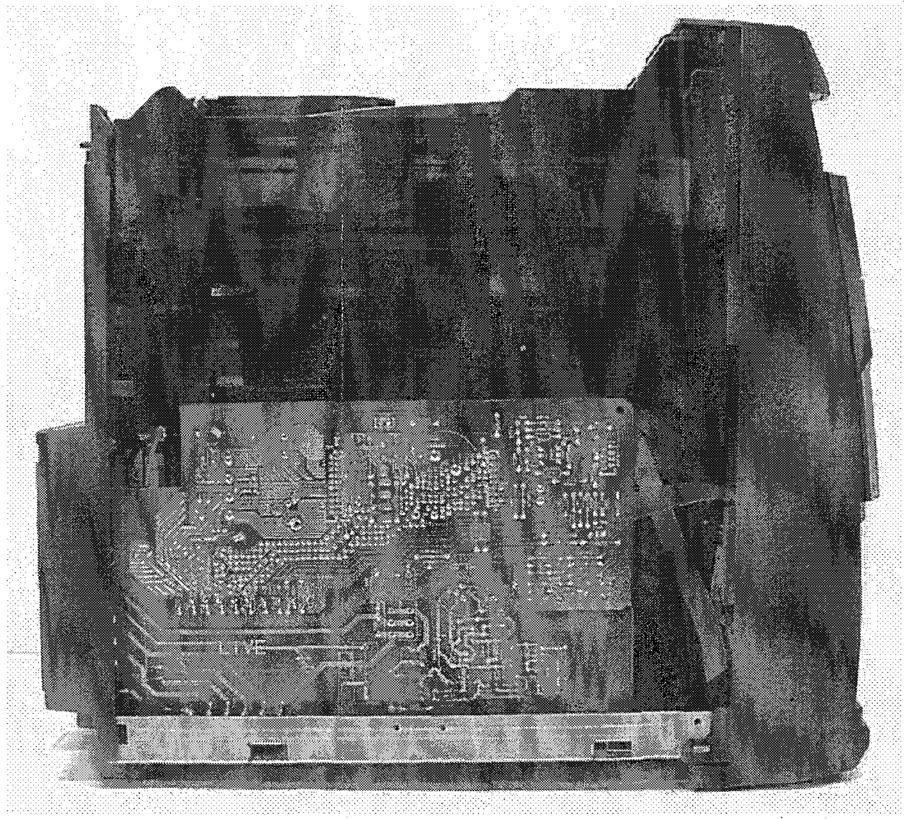


Figure 19

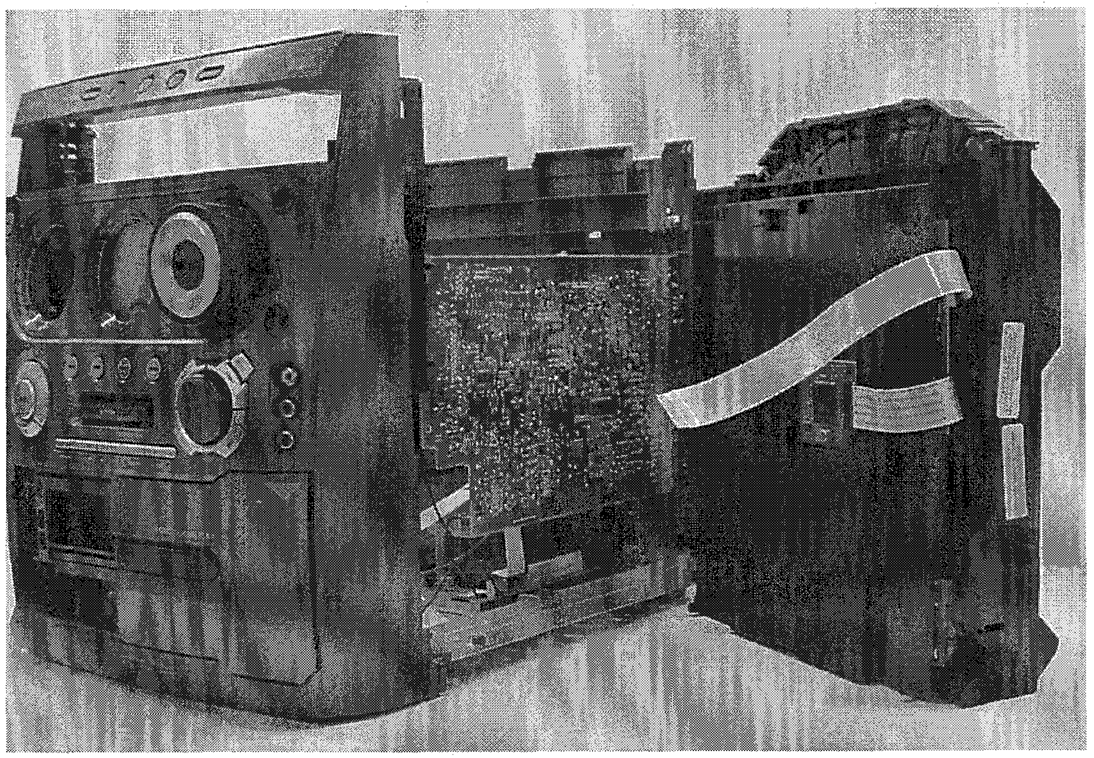
DISMANTLING INSTRUCTIONS

Service position A

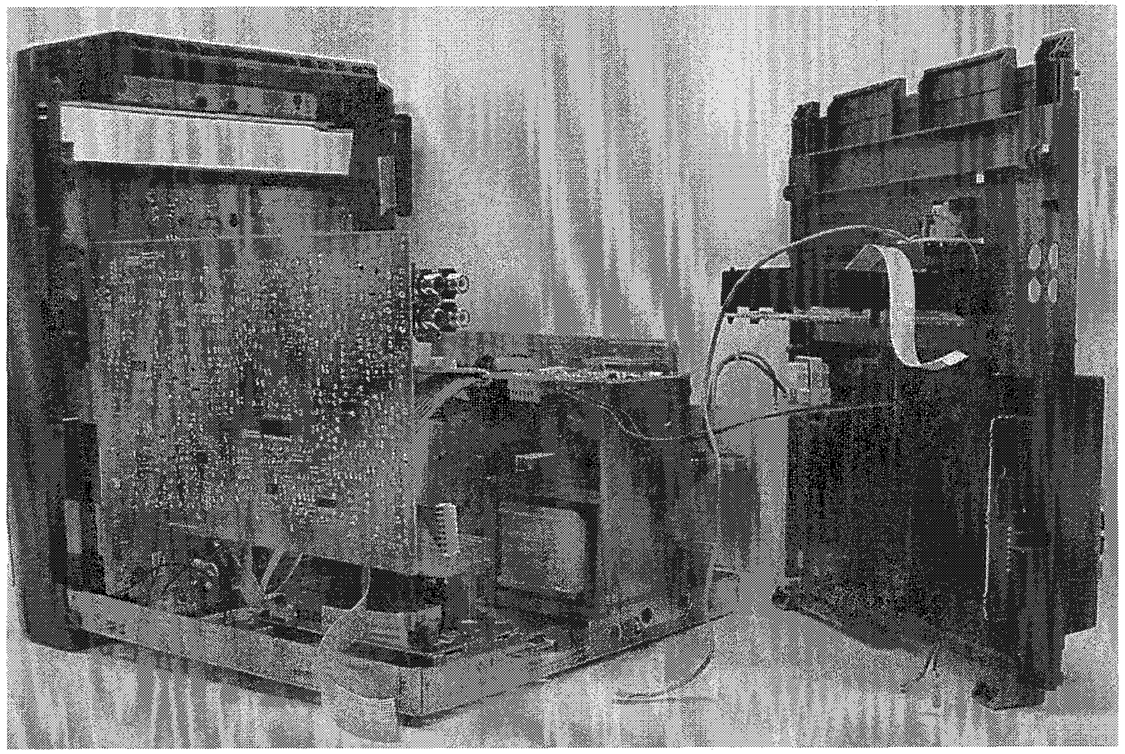




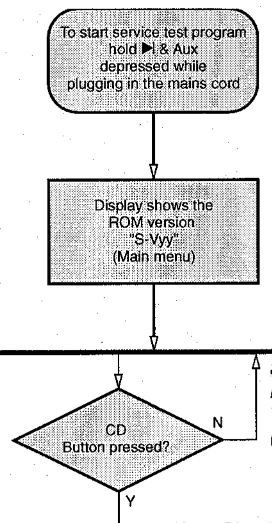
Service position B



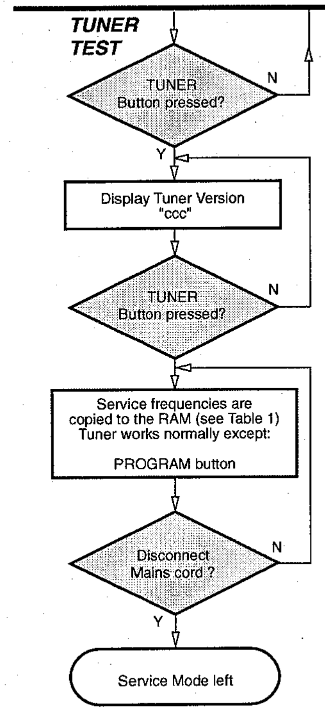
Service position C

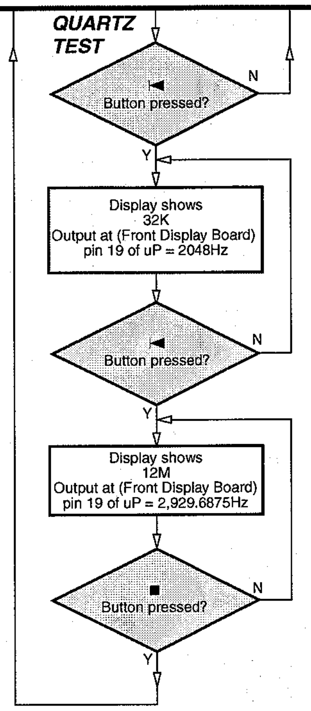


SERVICE TEST PROGRAM


To start service test program hold ▶| & Aux depressed while plugging in the mains cord
Display shows the ROM version "S-Vyy" (Main menu)
CD Button pressed?
N
Y

S refers to Service Mode
V refers to Version
yy refers to Software version number of the µProcessor (counting up from 01 to 99)


TUNER TEST
TUNER Button pressed?
N
Y
Display Tuner Version "ccc"
TUNER Button pressed?
N
Service frequencies are copied to the RAM (see Table 1) Tuner works normally except:
PROGRAM button
Disconnect Mains cord ?
N
Y
Service Mode left


QUARTZ TEST
|◀ Button pressed?
N
Y
Display shows 32K Output at (Front Display Board) pin 19 of uP = 2048Hz
|◀ Button pressed?
N
Y
Display shows 12M Output at (Front Display Board) pin 19 of uP = 2,929.6875Hz
■ Button pressed?
N
Y

3CDC CONTROL & MP3 CD MODULE TEST (For MP3 set only)

Note : Disc should be available on the tray before entering the Service Test Mode.

STEP	DISPLAY	MESSAGE		ACTION
		OKAY	ERROR	
1	5DTC-Vnn	-	5DTC-ER	Version of the 5DTC control software (nn = Version Number).
**2	TI-Vnn	-	-	Version of the MPEG software (nn = Version Number).
**3	TI BUS	BUS OK	BUS ER	Communication test between the Main uP and CD Module
**4	TI SLD I	-	-	CD SLEDGE MOTOR is moved in.
**5	TI SLD O	-	-	CD SLEDGE MOTOR is moved out.
**6	TI FOC	FOC OK	FOC ER	FOCUS SERVO Test.
				Press ■ to exit

** Choose level by pressing ◀◀ ⇕ ▶▶

PRESET	Europe "EUR"	East Eur. "EAS"	East Eur. Extended-band "EAS"	USA "USA"	Oversea "OSE"
1	87.5MHz	87.5MHz	65.81MHz	87.5MHz	87.5MHz
2	108MHz	108MHz	108MHz	108MHz	108MHz
3	531kHz	531kHz	74MHz	530kHz	531/530kHz*
4	1602kHz	1602kHz	87.5MHz	1700kHz	1602/1700kHz*
5	558kHz	558kHz	531kHz	560kHz	558/560kHz*
6	1494kHz	1494kHz	1602kHz	1500kHz	1494/1500kHz*
7	153kHz	87.5MHz	558kHz	98MHz	87.5MHz
8	279kHz	87.5MHz	1494kHz	87.5MHz	87.5MHz
9	198kHz	87.5MHz	98MHz	87.5MHz	87.5MHz
10	98MHz	87.5MHz	70.01MHz	87.5MHz	87.5MHz
11	87.5MHz	98MHz	65.81MHz	87.5MHz	98MHz

Table 1

Note: * Depending on the selected grid frequency (9 or 10kHz)
By holding the TUNER and ▶▶ buttons depressed while switching on the Mains supply, one of the undermentioned features will be activated:
- the tuning grid frequency is toggled between 9kHz and 10kHz for the Oversea (/21) version.
- the extended FM1 (65.81MHz - 74MHz) is toggled on and off for East Eur. (/34) version.

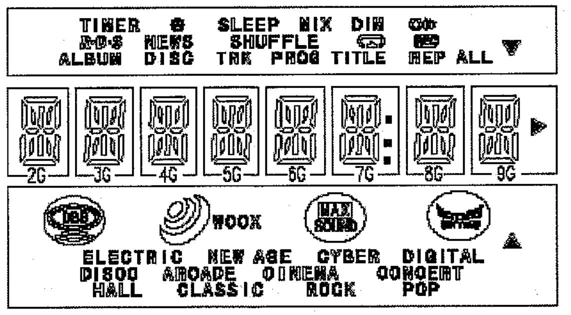

TIMER
SLEEP
MIX
DIM
RDS
NEWS
SHUFFLE
ALBUM
DISC
TRK
PROG
TITLE
REP
ALL
2G
3G
4G
5G
6G
7G
8G
9G
WOOX
MAX SOUND
ELECTRIC
NEW AGE
CYBER
DIGITAL
DISCO
ARCADE
CINEMA
CONCERT
HALL
CLASSIC
ROCK
POP

Figure 1

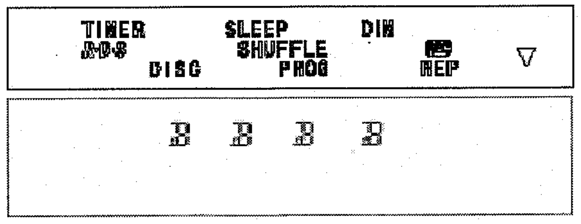
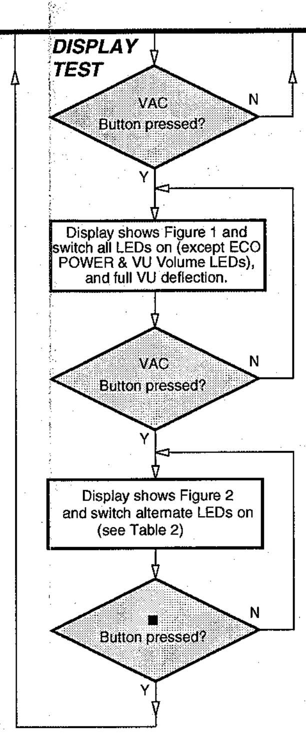

TIMER
SLEEP
DIM
RDS
SHUFFLE
DISC
PROG
REP

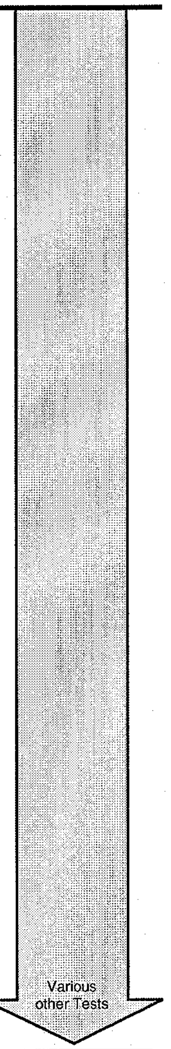
Figure 2


DISPLAY TEST
VAC Button pressed?
N
Y
Display shows Figure 1 and switch all LEDs on (except ECO POWER & VU Volume LEDs), and full VU deflection.
VAC Button pressed?
N
Y
Display shows Figure 2 and switch alternate LEDs on (see Table 2)
■ Button pressed?
N
Y

LEDs	FWM730	FWM570	
CD	ON	-	
TUNER	OFF	-	
TAPE	ON	-	
AUX / GAME	OFF	-	
^^ MAX (WOOX)	OFF	OFF	

To test Standby LED, put the set into ECO mode.

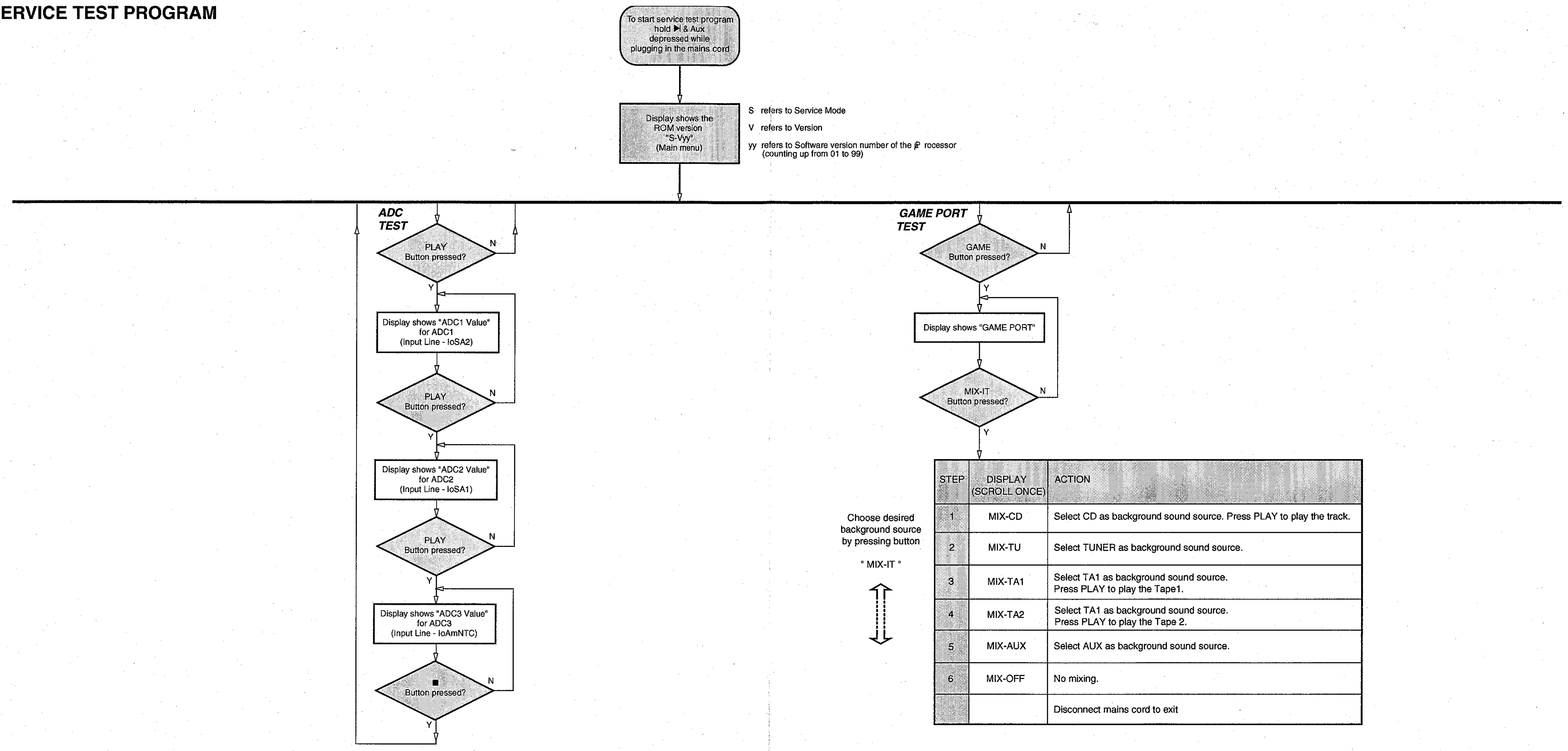
Table 2


Various other Tests

TEST	Activated with	ACTION
EEPROM TEST	▶▶ ■ to Exit	A test pattern will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test pattern correctly, otherwise "ERROR" will be displayed.
EEPROM FORMAT TEST	◀◀	Load default data. Display shows "NEW" for 1 second. ***Caution!*** ***All presets from the customer will be lost!!***
ROTARY ENCODER TEST	Rotary Volume Knob	Display shows value for 2 seconds. Values increases or decreases in steps of 1 until 0 (Min.) or 40 (Max.) is reached.
DEMO	^^ MAX/WOOX 2	DEMO will toggle on or off. The message: "DEMO ON" or "DEMO OFF" will scroll across the display to show the new status of the set.
LEAVE SERVICE TESTPROGRAM	Disconnect mains cord	

^^ MAX - FWM570, WOOX - FWM730

SERVICE TEST PROGRAM


To start service test program hold ▶I & Aux depressed while plugging in the mains cord
Display shows the ROM version "S-Vyy" (Main menu)
S refers to Service Mode
V refers to Version
yy refers to Software version number of the µP rocessor (counting up from 01 to 99)
ADC TEST
PLAY Button pressed?
N
Y
Display shows "ADC1 Value" for ADC1 (Input Line - IoSA2)
PLAY Button pressed?
N
Y
Display shows "ADC2 Value" for ADC2 (Input Line - IoSA1)
PLAY Button pressed?
N
Y
Display shows "ADC3 Value" for ADC3 (Input Line - IoAmNTC)
■ Button pressed?
N
Y
GAME PORT TEST
GAME Button pressed?
N
Y
Display shows "GAME PORT"
MIX-IT Button pressed?
N
Y

Choose desired background source by pressing button

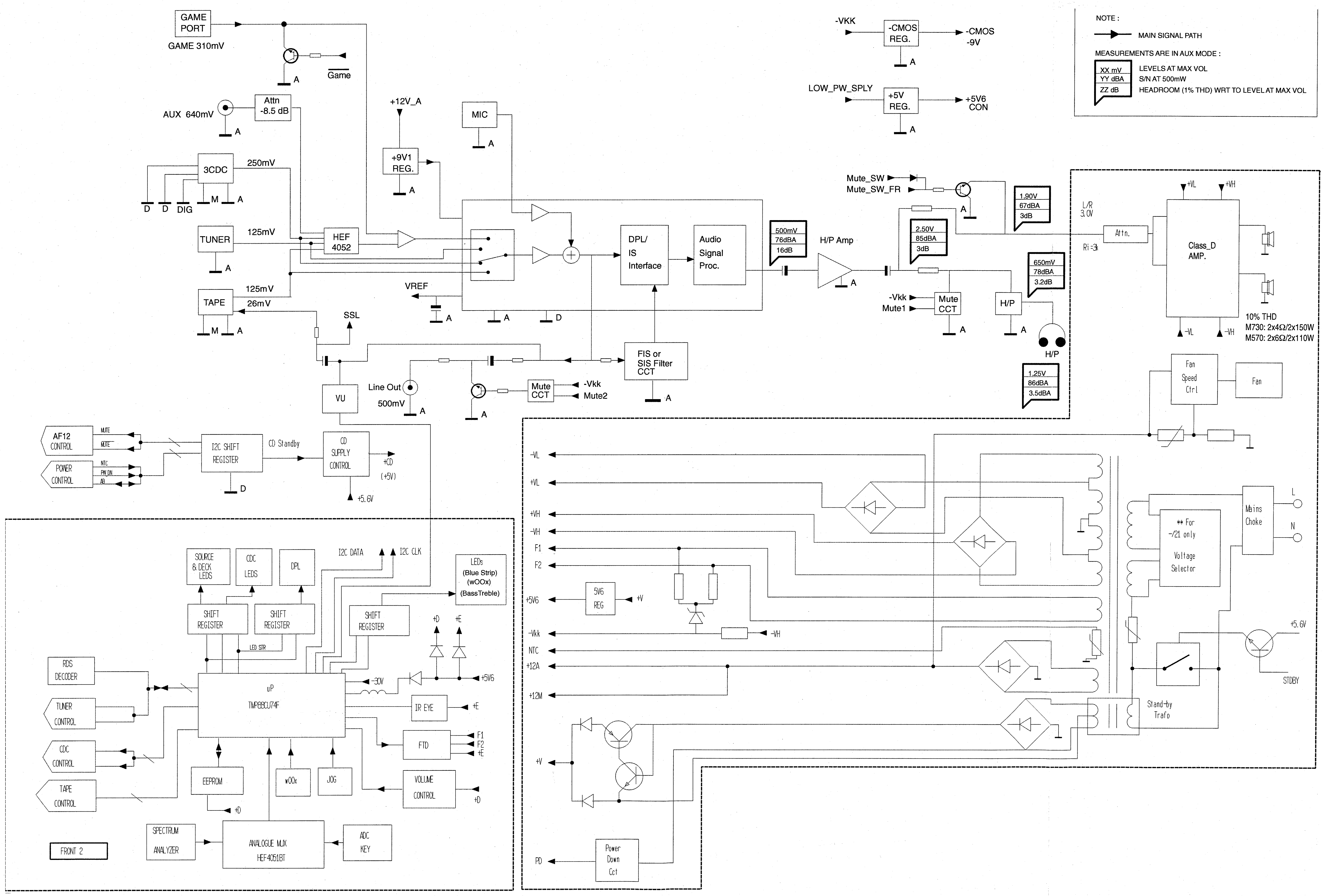
" MIX-IT "

STEP	DISPLAY (SCROLL ONCE)	ACTION
1	MIX-CD	Select CD as background sound source. Press PLAY to play the track.
2	MIX-TU	Select TUNER as background sound source.
3	MIX-TA1	Select TA1 as background sound source. Press PLAY to play the Tape1.
4	MIX-TA2	Select TA1 as background sound source. Press PLAY to play the Tape 2.
5	MIX-AUX	Select AUX as background sound source.
6	MIX-OFF	No mixing.
		Disconnect mains cord to exit

ADC Test is used for checking the ADC inputs to the microprocessor.

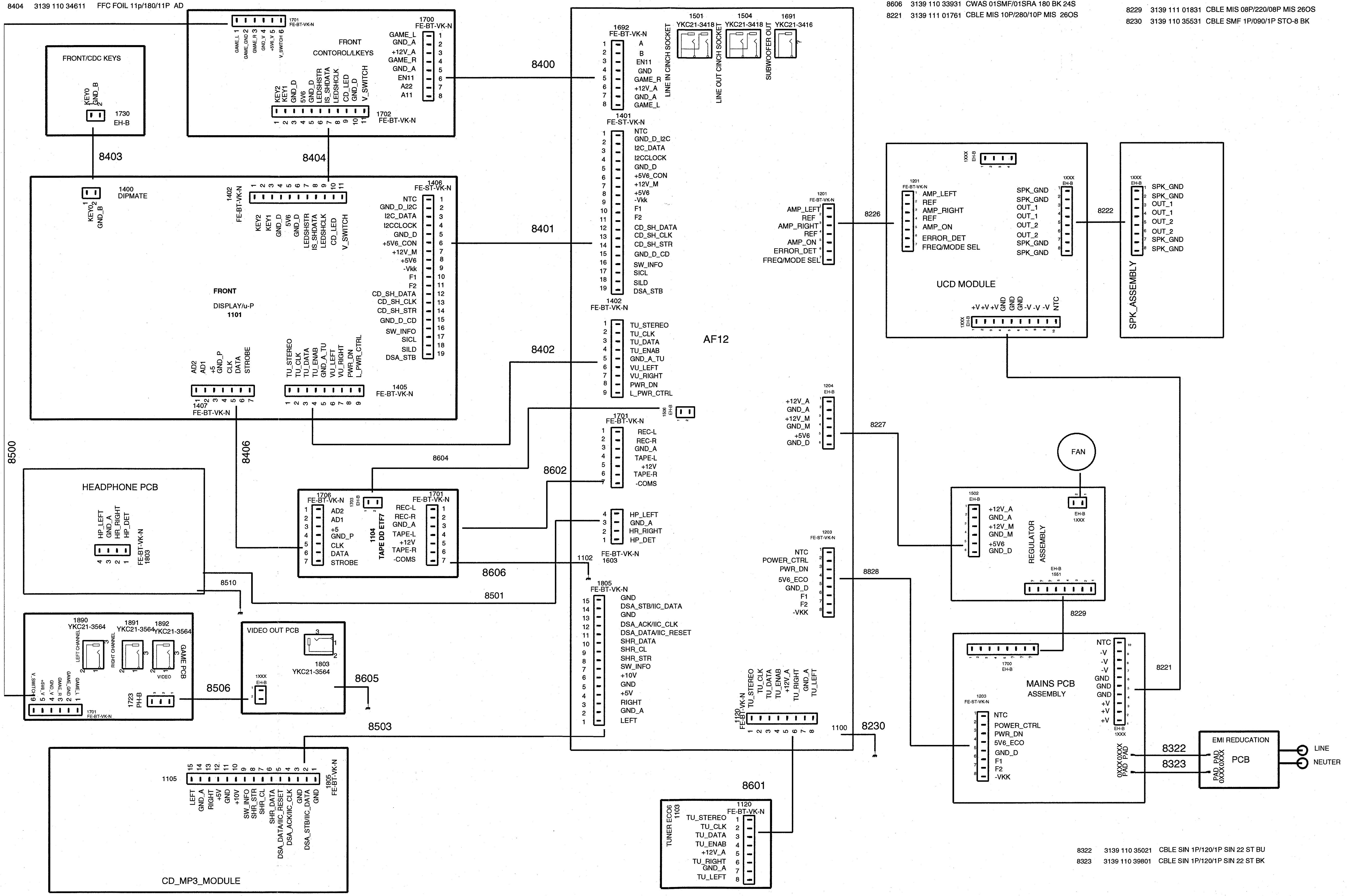
The display shows an ADC value between 0 and 255 for an input signal between 0 and 5V.

SERVICE BLOCK DIAGRAM


NOTE :
MAIN SIGNAL PATH
MEASUREMENTS ARE IN AUX MODE :
XX mV
YY dBA
ZZ dB
LEVELS AT MAX VOL
S/N AT 500mW
HEADROOM (1% THD) WRT TO LEVEL AT MAX VOL
GAME PORT
GAME 310mV
Game
A
AUX 640mV
Attn -8.5 dB
3CDC
250mV
D
D
DIG
M
TUNER
125mV
HEF 4052
TAPE
125mV
26mV
SSL
VREF
+12V_A
+9V1 REG.
MIC
DPL/ IS Interface
Audio Signal Proc.
FIS or SIS Filter CCT
Line Out
500mV
VU
Mute CCT
-Vkk
Mute2
-VKK
-CMOS REG.
-CMOS -9V
LOW_PW_SPLY
+5V REG.
+5V6 CON
Mute_SW
Mute_SW_FR
500mV
76dBA
16dB
H/P Amp
2.50V
85dBA
3dB
1.90V
67dBA
3dB
650mV
78dBA
3.2dB
1.25V
86dBA
3.5dBA
-Vkk
Mute1
Mute CCT
H/P
H/P
L/R 3.0V
Ri=3k
Attn.
+VL
+VH
-VL
-VH
Class_D AMP.
10% THD
M730: 2x4Ω/2x150W
M570: 2x6Ω/2x110W
Fan Speed Ctrl
Fan
AF12 CONTROL
MUTE
MUTE
POWER CONTROL
NTC
PW_ON
AB
I2C SHIFT REGISTER
CD Standby
CD SUPPLY CONTROL
+CD (+5V)
+5.6V
SOURCE & DECK LEDS
CDC LEDS
DPL
I2C DATA
I2C CLK
LEDs (Blue Strip) (wOOx) (BassTreble)
SHIFT REGISTER
SHIFT REGISTER
SHIFT REGISTER
LED STR
+D
+E
RDS DECODER
TUNER CONTROL
CDC CONTROL
TAPE CONTROL
uP
TMP88CU74F
-30V
+5V6
IR EYE
FTD
F1
F2
+E
EEPROM
wOOx
JOG
VOLUME CONTROL
+D
SPECTRUM ANALYZER
ANALOGUE MUX HEF4051BT
ADC KEY
FRONT 2
-VL
+VL
+VH
-VH
F1
F2
+5V6
5V6 REG
+V
-Vkk
-VH
NTC
+12A
+12M
+V
PD
Power Down Cct
** For -/21 only
Voltage Selector
Mains Choke
L
N
+5.6V
STDBY
Stand-by Trafo

SERVICE WIRING DIAGRAM

8400	3139 110 34921	FFC FOIL 08P/280/08P BD
8401	3139 111 02491	FFC FOIL 19P/280/19P AD
8402	3140 110 22471	FFC FOIL 09P/280/09P AD
8403	3139 110 37171	CBLE HR 02P/220/02P OE 26OS BK
8404	3139 110 34611	FFC FOIL 11p/180/11P AD
8406	3140 110 22481	FFC FOIL 07P/280/07P BD
8500	3139 110 35211	FFC FOIL 06P/80/06P AD
8501	3139 110 33941	FFC FOIL 04P/180/04P BD
8503	3139 110 35881	FFC FOIL 15P/180/15P BD
8506	3140 110 22451	CBLE PH 3P/340/3P OE SCR WIRE
8510	3139 111 02641	CWAS SMF 1P/22O/1P STO-8 BK
8601	3139 110 35050	FFC FOIL 08P/220/08P AD
8602	3139 110 34131	FFC FOIL 07P/180/07P AD
8604	3139 110 38381	CBLE HR 02P/180/02P HR 26 OS BK
8605	3139 111 02621	CWAS SMF 1P/280/1P STO-8 BK
8606	3139 110 33931	CWAS 01SMF/01SRA 180 BK 24S
8221	3139 111 01761	CBLE MIS 10P/280/10P MIS 26OS
8222	3139 111 02131	CBLE MIS 08P/120/08P MIS 26OS
8226	3139 110 35901	FFC FOIL 07P/220/07P AD
8227	3139 111 03201	CBLE MIS 06P/220/06P MIS 26OS
8228	3140 110 22501	FFC FOIL 08P/280/08P AD
8229	3139 111 01831	CBLE MIS 08P/220/08P MIS 26OS
8230	3139 110 35531	CBLE SMF 1P/090/1P STO-8 BK


FRONT/CDC KEYS
KEY0
GND_B
1730
EH-B
8403
FRONT
CONTOROL/LKEYS
1701
FE-BT-VK-N
GAME_L
GAME_GND
GMAE_R
GND_V
+5V6_V
V_SWITCH
1700
FE-BT-VK-N
GAME_L
GND_A
+12V_A
GAME_R
GND_A
EN11
A22
A11
1702
FE-BT-VK-N
KEY2
KEY1
GND_D
5V6
GND_D
LEDSHSTR
IS_SHDATA
LEDSHCLK
CD_LED
GND_D
V_SWITCH
8400
8404
1400
DIPMATE
1402
FE-BT-VK-N
1406
FE-ST-VK-N
NTC
GND_D_I2C
I2C_DATA
I2CCLOCK
GND_D
+5V6_CON
+12V_M
+5V6
-Vkk
F1
F2
CD_SH_DATA
CD_SH_CLK
CD_SH_STR
GND_D_CD
SW_INFO
SICL
SILD
DSA_STB
FRONT
DISPLAY/u-P
1101
AD2
AD1
+5
GND_P
CLK
DATA
STROBE
1407
FE-BT-VK-N
TU_STEREO
TU_CLK
TU_DATA
TU_ENAB
GND_A_TU
VU_LEFT
VU_RIGHT
PWR_DN
L_PWR_CTRL
1405
FE-BT-VK-N
8401
8402
8500
8406
8604
8602
8606
8501
8510
HEADPHONE PCB
HP_LEFT
GND_A
HR_RIGHT
HP_DET
FE-BT-VK-N
1803
1706
FE-BT-VK-N
1703
EH-B
1701
FE-BT-VK-N
REC-L
REC-R
GND_A
TAPE-L
+12V
TAPE-R
-COMS
1104
TAPE DD ETF7
1890
YKC21-3564
1891
YKC21-3564
1892
YKC21-3564
LEFT CHANNEL
RIGHT CHANNEL
VIDEO
GAME PCB
V_SWITCH
+5V6_V
GND_V
GAME_R
GAME_GND
GAME_L
1723
PH-B
8506
VIDEO OUT PCB
1803
YKC21-3564
1XXX
EH-B
8605
8503
CD_MP3_MODULE
1105
LEFT
GND_A
RIGHT
+5V
GND
+10V
SW_INFO
SHR_STR
SHR_CL
SHR_DATA
DSA_DATA/IIC_RESET
DSA_ACK/IIC_CLK
GND
DSA_STB/IIC_DATA
GND
1805
FE-BT-VK-N
AF12
1692
FE-BT-VK-N
A
B
EN11
GND
GAME_R
+12V_A
GND_A
GAME_L
1501
YKC21-3418
1504
YKC21-3418
1691
YKC21-3416
LINE IN CINCH SOCKET
LINE OUT CINCH SOCKET
SUBWOOFER OUT
1401
FE-ST-VK-N
1506
EH-B
1701
FE-BT-VK-N
HP_LEFT
GND_A
HR_RIGHT
HP_DET
FE-BT-VK-N
1603
1102
1805
FE-BT-VK-N
GND
DSA_STB/IIC_DATA
GND
DSA_ACK/IIC_CLK
DSA_DATA/IIC_RESET
SHR_DATA
SHR_CL
SHR_STR
SW_INFO
+10V
GND
+5V
RIGHT
GND_A
LEFT
1120
FE-BT-VK-N
1100
8230
1201
FE-BT-VK-N
AMP_LEFT
REF
AMP_RIGHT
REF
AMP_ON
ERROR_DET
FREQ/MODE SEL
1204
EH-B
+12V_A
GND_A
+12V_M
GND_M
+5V6
GND_D
1203
FE-ST-VK-N
NTC
POWER_CTRL
PWR_DN
5V6_ECO
GND_D
F1
F2
-VKK
8226
8227
8828
8601
TUNER ECO6
1103
1120
FE-BT-VK-N
TU_STEREO
TU_CLK
TU_DATA
TU_ENAB
+12V_A
TU_RIGHT
GND_A
TU_LEFT
UCD MODULE
1XXX
EH-B
SPK_GND
OUT_1
OUT_2
+V +V +V GND GND GND -V -V -V NTC
8222
SPK_ASSEMBLY
FAN
1502
EH-B
REGULATOR ASSEMBLY
1551
8229
1700
EH-B
MAINS PCB ASSEMBLY
1203
FE-ST-VK-N
NTC
-V
GND
+V
8221
EMI REDUCATION
PCB
PAD 0XXX
8322
8323
LINE
NEUTER

8322	3139 110 35021	CBLE SIN 1P/120/1P SIN 22 ST BU
8323	3139 110 39801	CBLE SIN 1P/120/1P SIN 22 ST BK

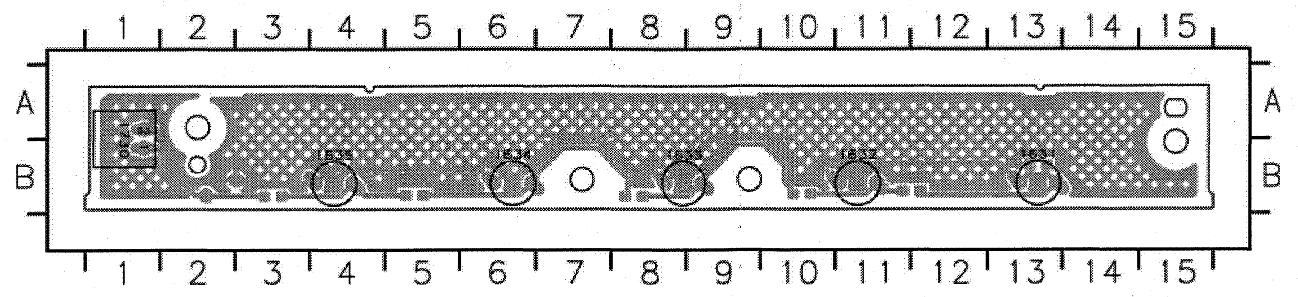
FRONT CONTROL BOARD

TABLE OF CONTENTS

CDC Key part - Layout & Circuit diagram 5-1
Control part - Component Layout 5-2
Control part - Chip Layout 5-3
Control part - Circuit diagram 5-4
Game Port part - Layout & Circuit diagram 5-5
Electrical parts list... 5-6

CDC KEY BOARD - COMPONENT LAYOUT

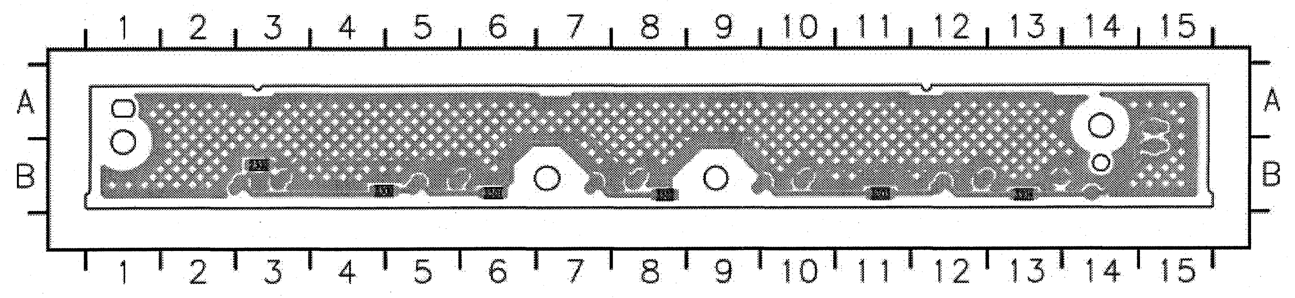
1631 B13 1632 B11 1633 B8 1634 B6 1635 B4 1730 B1



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
A
B
1635
1634
1633
1632
1631

CDC KEY BOARD - CHIP LAYOUT

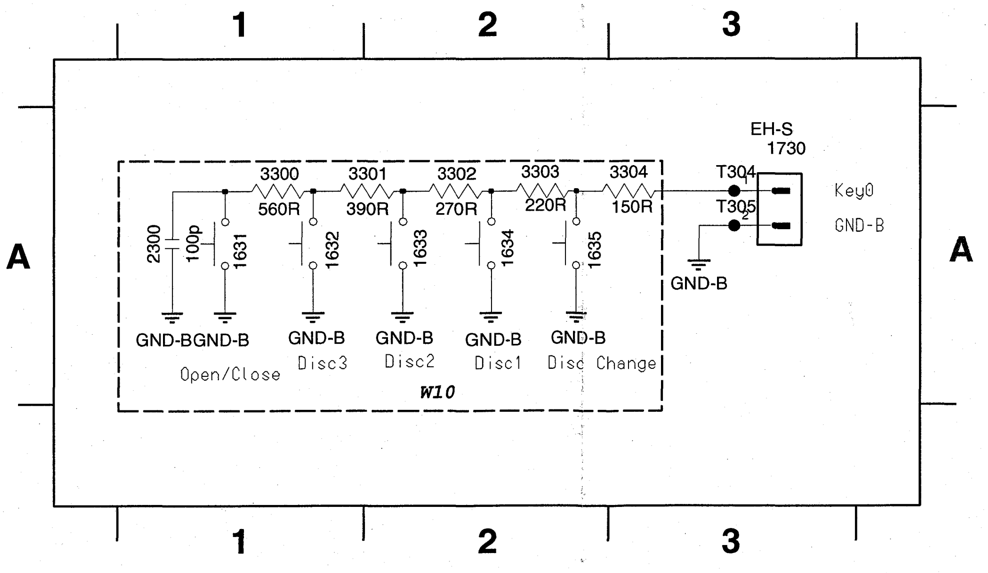
2300 B3 3300 B4 3301 B6 3302 B8 3303 B11 3304 B13



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
A
B

CDC KEY BOARD - CIRCUIT DIAGRAM

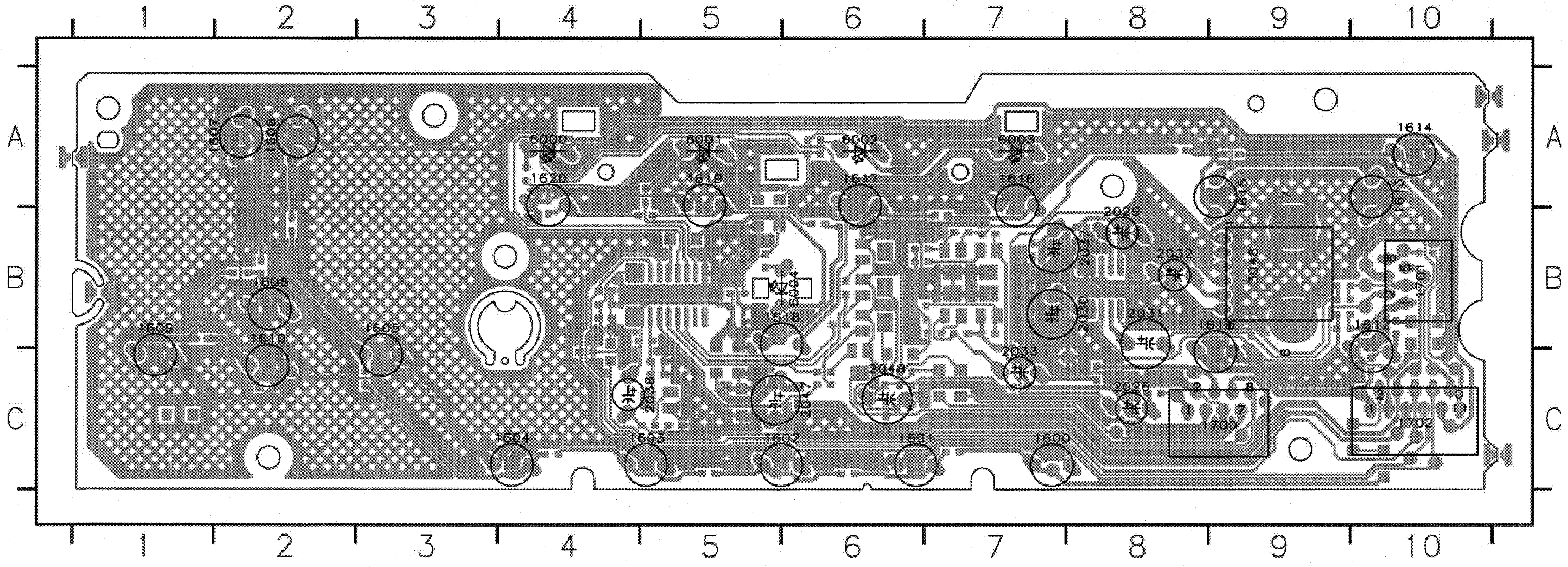
1631 A1 1633 A2 1635 A2 2300 A1 3301 A2 3303 A2 T304 A3
1632 A1 1634 A2 1730 A3 3300 A1 3302 A2 3304 A3 T305 A3



1
2
3
A
EH-S
1730
3300
560R
3301
390R
3302
270R
3303
220R
3304
150R
T304
T305
Key0
GND-B
2300
100p
1631
1632
1633
1634
1635
GND-B
GND-B
GND-B
GND-B
GND-B
GND-B
GND-B
Open/Close
Disc3
Disc2
Disc1
Disc Change
W10

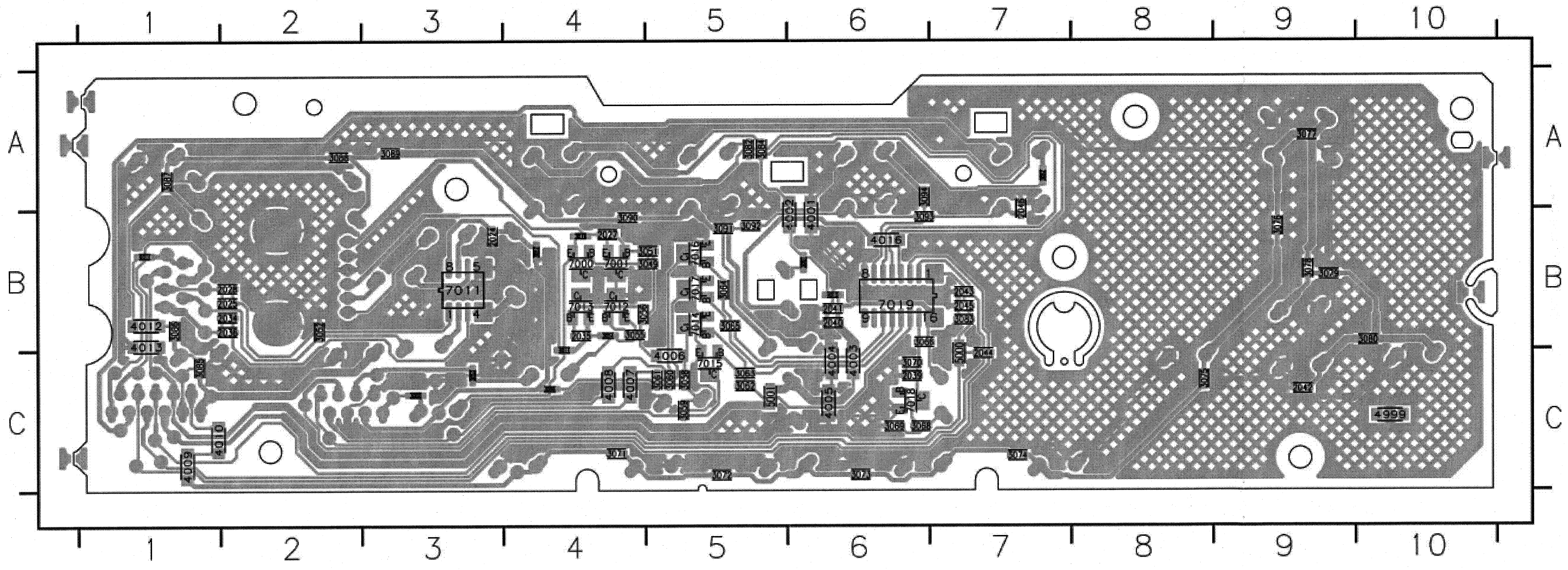
CONTROL BOARD - COMPONENT LAYOUT

1600	C8
1601	C6
1602	C6
1603	C5
1604	C4
1605	C3
1606	A2
1607	A1
1608	B2
1609	B1
1610	C2
1611	C9
1612	B10
1613	A10
1614	A10
1615	A8
1616	A7
1617	A6
1618	B6
1619	A5
1620	A4
1700	C9
1701	B10
1702	C10
2026	C8
2029	B8
2030	B8
2031	B8
2032	B8
2033	C7
2037	B8
2038	C5
2047	C6
2048	C6
3048	B10
6000	A4
6001	A5
6002	A6
6003	A7
6004	B6

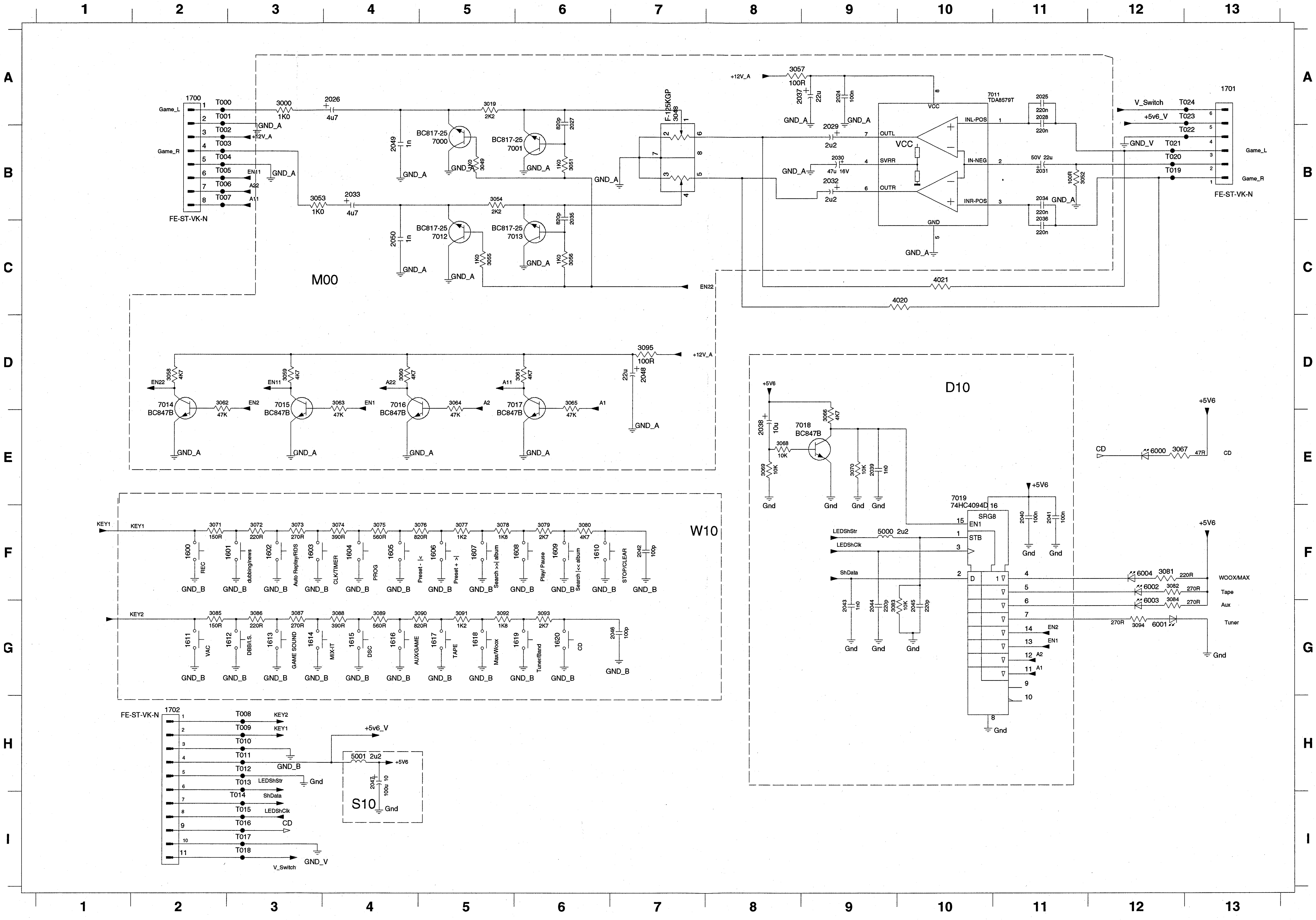

1
2
3
4
5
6
7
8
9
10
A
B
C
1607
1606
6000
6001
6002
6003
1620
1619
1617
1616
1614
1615
1613
2029
2037
2032
3048
1701
6004
1608
1609
1610
1605
1618
2030
2031
1611
1612
2033
2048
2038
2047
2026
1700
1702
1604
1603
1602
1601
1600

CONTROL BOARD - CHIP LAYOUT

2024	B3	2039	C6	2046	B7	3054	B4	3061	C5	3068	C6	3075	C8	3082	A5	3089	A3	4001	B6	4008	C4	4015	B6	7011	B3	7018	C6
2025	B2	2040	B6	3000	C3	3055	B4	3062	C5	3069	C6	3076	B9	3083	B7	3090	B4	4002	B5	4009	C1	4016	B6	7012	B5	7019	B7
2027	B4	2041	B6	3019	B4	3056	B4	3063	C5	3070	C6	3077	A9	3084	A5	3091	B5	4003	C6	4010	C2	4999	C10	7013	B4		
2028	B2	2042	C9	3049	B5	3057	B4	3064	B5	3071	C4	3078	B9	3085	C1	3092	B5	4004	C6	4011	B1	5000	C7	7014	B5		
2034	B2	2043	B7	3051	B5	3058	C5	3065	B5	3072	C5	3079	B9	3086	B1	3093	B6	4005	C6	4012	B1	5001	C5	7015	C5		
2035	B4	2044	C7	3052	B2	3059	C5	3066	B6	3073	C6	3080	B10	3087	A1	3094	A6	4006	C4	4013	B1	7000	B4	7016	B5		
2036	B2	2045	B7	3053	C3	3060	C5	3067	A7	3074	C7	3081	B6	3088	A2	3095	C4	4007	C4	4014	B4	7001	B5	7017	B5		


1
2
3
4
5
6
7
8
9
10
A
B
C
7011
7019
7000
7001
7012
7013
7015
7016
7017
7014
7018
4012
4013
4009
4010
4006
4016
4999
4001
4002
4003
4004
4005
4007
4008
5000
5001

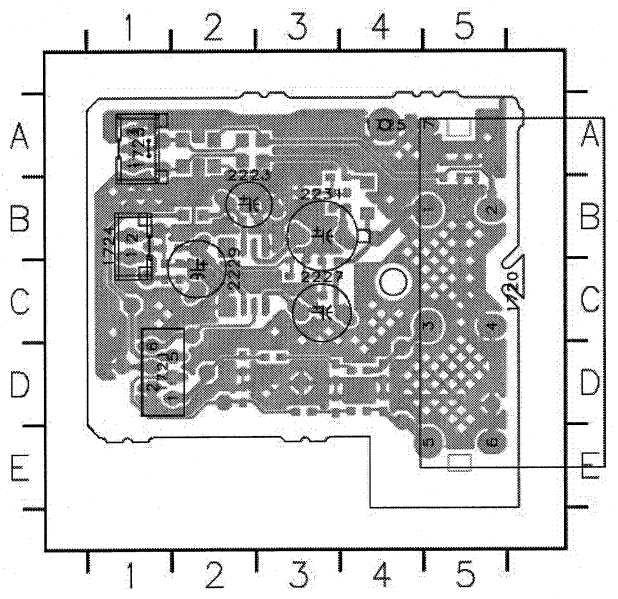
CONTROL BOARD - CIRCUIT DIAGRAM


1
2
3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
F
G
H
I
M00
D10
W10
S10
1700
FE-ST-VK-N
Game_L
Game_R
T000
T001
T002
T003
T004
T005
T006
T007
GND_A
+12V_A
EN11
A22
A11
3000 1K0
2026 4u7
3053 1K0
2033 4u7
2049 1n
2050 1n
BC817-25 7000
BC817-25 7001
BC817-25 7012
BC817-25 7013
3019 2K2
3054 2K2
820p 2027
820p 2035
3049
1K0 3051
1K0 3055
1K0 3056
F-125KGP 3048
EN22
3057 100R
2037 22u
2024 100n
7011 TDA8579T
VCC
OUTL
SVRR
OUTR
GND
INL-POS
IN-NEG
INR-POS
2029 2u2
2030 47u 16V
2032 2u2
2025 220n
2028 220n
50V 22u 2031
100R 3052
2034 220n
2036 220n
4021
4020
1701
V_Switch
+5v6_V
GND_V
T024
T023
T022
T021
T020
T019
3095 100R
22u 2048
3058 4K7
3059 4K7
3060 4K7
3061 4K7
7014 BC847B
7015 BC847B
7016 BC847B
7017 BC847B
3062 47K
3063 47K
3064 47K
3065 47K
EN2
EN1
A2
A1
+5V6
2038 10u
3066 4K7
7018 BC847B
3068 10K
3069 10K
3070 10K
2039 1n0
Gnd
CD
6000
3067 47R
7019 74HC4094D
SRG8
EN1
STB
D
LEDShStr
LEDShClk
ShData
5000 2u2
2040 100n
2041 100n
2043 1n0
2044 220p
3083 10K
2045 220p
6004
3081 220R
WOOX/MAX
6002
3082 270R
Tape
6003
3084 270R
Aux
270R 3094
6001
Tuner
KEY1
KEY2
3071 150R
3072 220R
3073 270R
3074 390R
3075 560R
3076 820R
3077 1K2
3078 1K8
3079 2K7
3080 4K7
1600 REC
1601 dubbing/news
1602
1603 Auto Replay/RDS
1604 CLK/TIMER
1605 PROG
1606 Preset - |<
1607 Preset + >|
1608 Search >> album
1609 Play/ Pause
1610 Search |<< album
STOP/CLEAR
2042 100p
GND_B
3085 150R
3086 220R
3087 270R
3088 390R
3089 560R
3090 820R
3091 1K2
3092 1K8
3093 2K7
1611 VAC
1612 DBB/I.S.
1613 GAME SOUND
1614 MIX-IT
1615 DSC
1616 AUX/GAME
1617 TAPE
1618 Max/Woox
1619 Tuner/Band
1620 CD
2046 100p
1702
T008
T009
T010
T011
T012
T013
T014
T015
T016
T017
T018
+5v6_V
5001 2u2
2047 100u 10
GND_V

1600	F2
1601	F2
1602	F3
1603	F3
1604	F4
1605	F4
1606	F5
1607	F5
1608	F5
1609	F6
1610	F6
1611	G2
1612	G2
1613	G3
1614	G3
1615	G4
1616	G4
1617	G5
1618	G5
1619	G5
1620	G6
1700	A2
1701	A13
1702	H2
2024	A9
2025	A11
2026	A4
2027	A6
2028	A11
2029	B9
2030	B9
2031	B11
2032	B9
2033	B4
2034	B11
2035	B6
2036	C11
2037	A9
2038	E8
2039	E9
2040	F11
2041	F11
2042	F7
2043	G9
2044	G9
2045	G10
2046	G7
2047	H4
2048	D7
2049	B4
2050	C4
3000	A3
3019	A5
3048	A7
3049	B5
3051	B6
3052	B11
3053	B3
3054	B5
3055	C5
3056	C6
3057	A8
3058	D2
3059	D3
3060	D4
3061	D6
3062	D2
3063	D4
3064	D5
3065	D6
3066	E9
3067	E12
3068	E8
3069	E8
3070	E9
3071	F2
3072	F3
3073	F3
3074	F4
3075	F4
3076	F5
3077	F5
3078	F5
3079	F6
3080	F6
3081	F12
3082	F12
3083	G9
3084	G12
3085	G2
3086	G3
3087	G3
3088	G4
3089	G4
3090	G5
3091	G5
3092	G5
3093	G6
3094	G12
3095	D7
3096	B4
3097	C4
4020	C10
4021	C10
5000	F9
5001	H4
6000	E12
6001	G12
6002	F12
6003	G12
6004	F12
7000	B5
7001	B6
7011	A10
7012	C5
7013	C6
7014	D2
7015	D3
7016	D4
7017	D6
7018	E8
7019	E10
T000	A2
T001	A2
T002	B2
T003	B2
T004	B2
T005	B2
T006	B2
T007	B2
T008	H3
T009	H3
T010	H3
T011	H3
T012	H3
T013	H3
T014	I3
T015	I3
T016	I3
T017	I3
T018	I3
T019	B12
T020	B12
T021	B12
T022	B13
T023	A13
T024	A13

GAME PORT BOARD - COMPONENT LAYOUT

1720	B4	1724	B1	2227	D3
1721	D1	1725	A4	2229	C2
1723	A1	2223	A2	2231	B3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A
B
C
D
E
1723
1724
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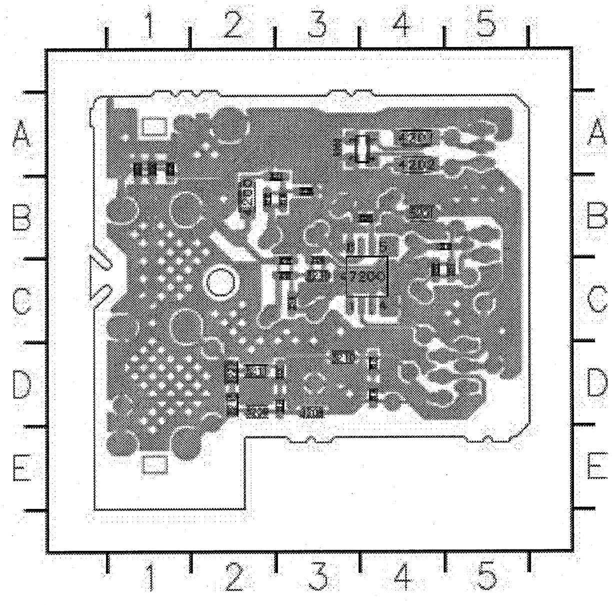
2223
2231
2229
2227
1720

GAME PORT BOARD - CHIP LAYOUT

2214	D3	2224	B4	3216	B3	3224	C5
2215	D2	2226	A1	3217	B2	3225	C4
2216	D4	2228	B3	3218	C3	4200	B2
2217	D4	2230	C3	3219	B5	4201	A4
2218	A1	3208	D3	3220	C3	4202	B4
2220	A1	3209	D2	3221	B3	5201	B4
2221	D3	3210	D3	3222	C3	5202	A3
2222	D2	3211	D2	3223	C3	7200	C4


1
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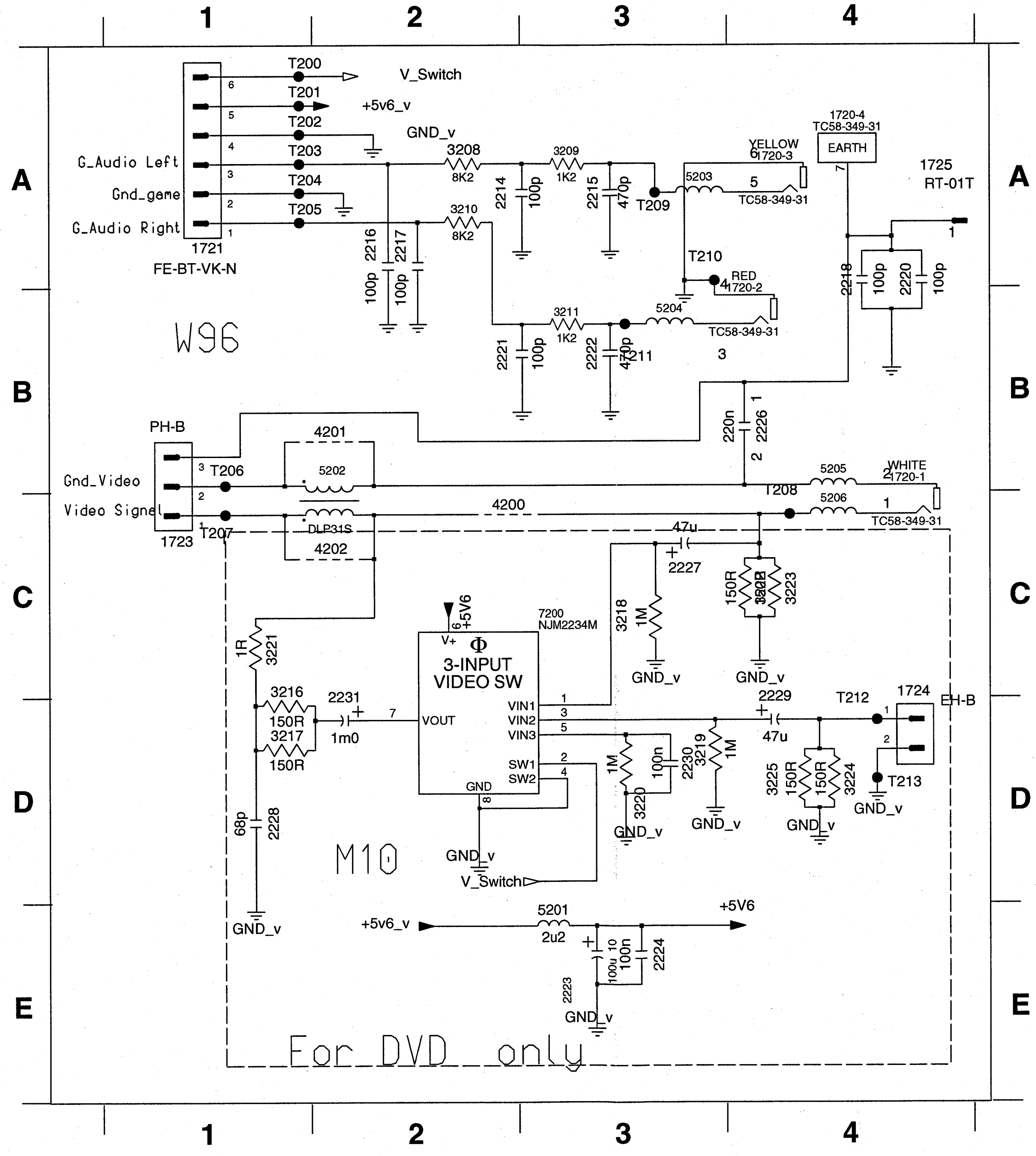
A
B
C
D
E
4201
4202
7200

GAME PORT BOARD - CIRCUIT DIAGRAM

1720-1 B4	1725 A4	2221 B2	2229 D4	3216 C1	3223 C4	5202 B2	T201 A1	T208 C4
1720-2 B4	2214 A2	2222 B3	2230 D3	3217 D1	3224 D4	5203 A3	T202 A1	T209 A3
1720-3 A4	2215 A3	2223 E3	2231 D2	3218 C3	3225 D4	5204 B3	T203 A1	T210 A3
1720-4 A4	2216 A2	2224 E3	3208 A2	3219 D3	4200 C2	5205 B4	T204 A1	T211 B3
1721 A1	2217 A2	2226 B4	3209 A3	3220 D3	4201 B2	5206 C4	T205 A1	T212 D4
1723 C1	2218 A4	2227 C3	3210 A2	3221 C1	4202 C2	7200 C3	T206 B1	T213 D4
1724 C4	2220 A4	2228 D1	3211 B3	3222 C4	5201 E3	T200 A1	T207 C1	


1
2
3
4
A
B
C
D
E
T200
V_Switch
T201
+5v6_v
T202
GND_v
T203
T204
T205
G_Audio Left
Gnd_game
G_Audio Right
1721
FE-BT-VK-N
3208
8K2
3209
1K2
3210
8K2
3211
1K2
2214
100p
2215
470p
2216
100p
2217
100p
2221
100p
2222
470p
T209
T210
T211
5203
5204
TC58-349-31
YELLOW
1720-3
RED
1720-2
1720-4
TC58-349-31
EARTH
1725
RT-01T
2218
100p
2220
100p
W96
PH-B
Gnd_Video
Video Signal
1723
T206
T207
4201
5202
4200
DLP31S
4202
220n
2226
T208
5205
WHITE
1720-1
5206
47u
2227
150R
3222
3223
3218
1M
GND_v
+5V6
7200
NJM2234M
V+
Φ
3-INPUT
VIDEO SW
VIN1
VIN2
VIN3
VOUT
SW1
SW2
GND
3221
1R
3216
150R
3217
150R
2231
1m0
2228
68p
2229
47u
T212
1724
EH-B
T213
3219
1M
3220
1M
2230
100n
3225
150R
3224
150R
M10
V_Switch
5201
2u2
+5V6
2223
100u 10
2224
100n
For DVD only

ELECTRICAL PARTS - FRONT CONTROL BOARD

1600	482227613775	TACT SW
1601	482227613775	TACT SW
1602	482227613775	TACT SW
1603	482227613775	TACT SW
1604	482227613775	TACT SW
1605	482227613775	TACT SW
1606	482227613775	TACT SW
1607	482227613775	TACT SW
1608	482227613775	TACT SW
1609	482227613775	TACT SW
1610	482227613775	TACT SW
1611	482227613775	TACT SW
1612	482227613775	TACT SW
1613	482227613775	TACT SW
1614	482227613775	TACT SW
1615	482227613775	TACT SW
1616	482227613775	TACT SW
1617	482227613775	TACT SW
1618	482227613775	TACT SW
1619	482227613775	TACT SW
1620	482227613775	TACT SW
1631	482227613775	TACT SW
1632	482227613775	TACT SW
1633	482227613775	TACT SW
1634	482227613775	TACT SW
1635	482227613775	TACT SW
1720	994000001862	SOC CINCH H 3P
3048	994000001861	POTM CAR LIN
6000	994000001863	LED BT-436N-31-F3.5-T20
6001	994000001863	LED BT-436N-31-F3.5-T20
6002	994000001863	LED BT-436N-31-F3.5-T20
6003	994000001863	LED BT-436N-31-F3.5-T20
6004	994000001864	LED BT-502BXK-31-470E-B6-F3.5
7019	482220915449	IC 74HC4094D

Note: Only these parts mentioned in the list are normal service parts.

FRONT DISPLAY BOARD

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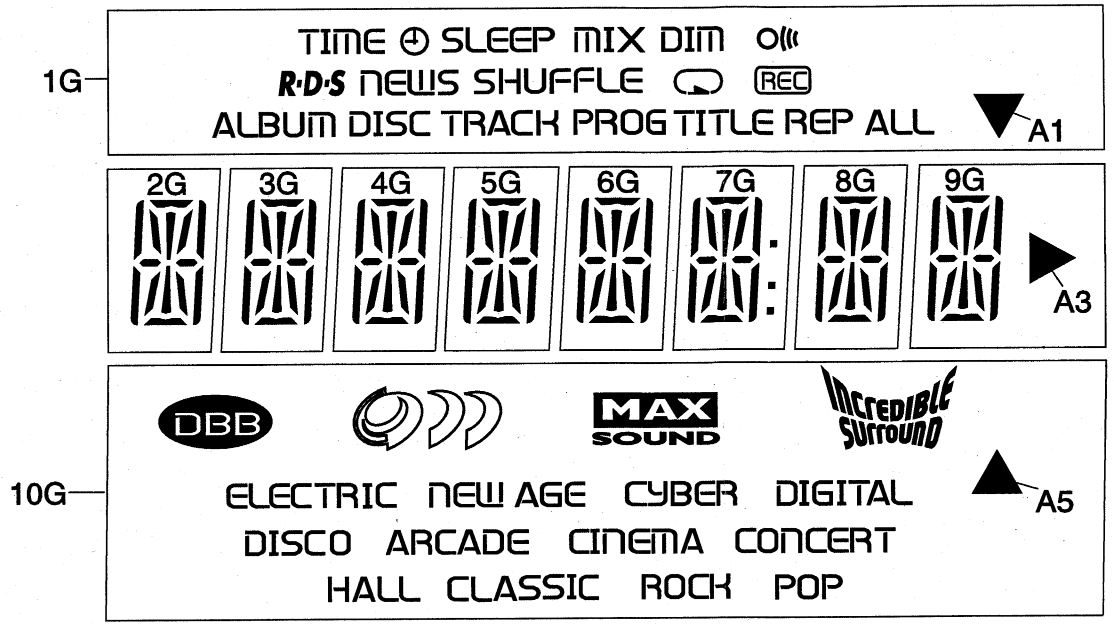
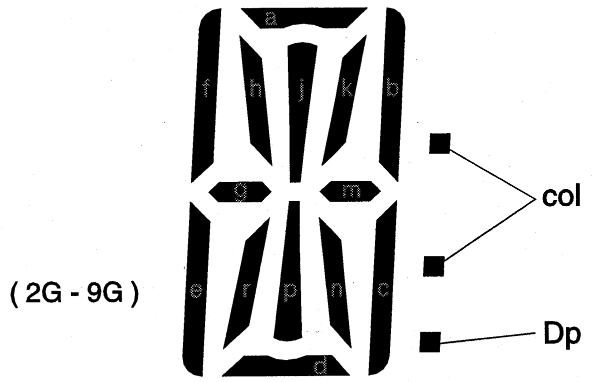
FTD DISPLAY PIN CONNECTION



1G
TIME ⊕ SLEEP MIX DIM O(((
R·D·S NEWS SHUFFLE ↻ REC
ALBUM DISC TRACK PROG TITLE REP ALL ▼ A1
2G 3G 4G 5G 6G 7G 8G 9G
▶ A3
10G
DBB
MAX SOUND
INCREDIBLE SURROUND
ELECTRIC NEW AGE CYBER DIGITAL ▲ A5
DISCO ARCADE CINEMA CONCERT
HALL CLASSIC ROCK POP

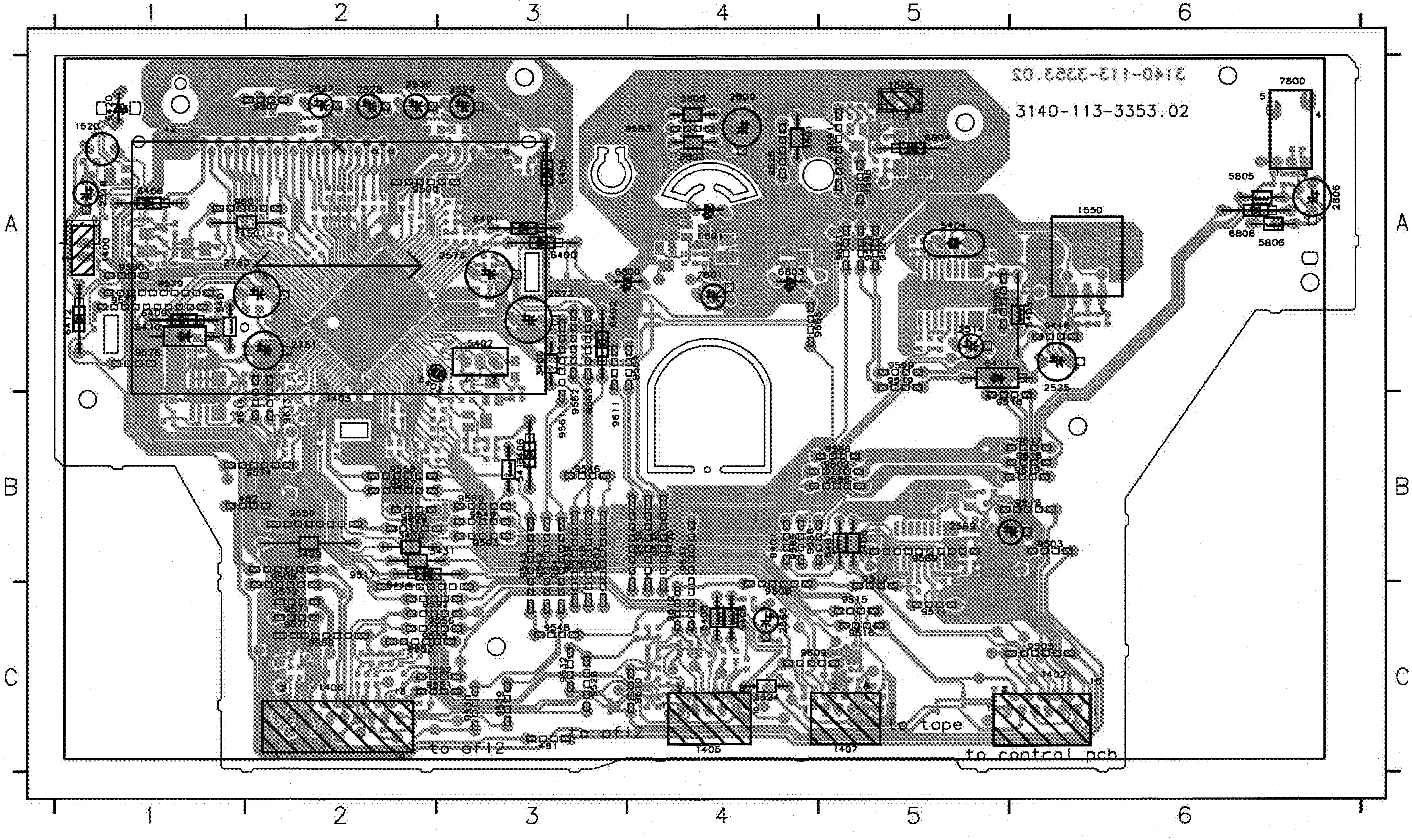


a
f
h
j
k
b
g
m
col
(2G - 9G)
e
r
p
n
c
d
Dp

	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G
P1	TIME	a	a	a	a	a	a	a	a	DBB
P2	⊕	h	h	h	h	h	h	h	h	◎
P3	SLEEP	j , p	j , p	j , p	j , p	j , p	j , p	j , p	j , p	)(Left)
P4	MIX	k	k	k	k	k	k	k	k	)(Right)
P5	DIM	b	b	b	b	b	b	b	b	MAX SOUND
P6	O(((	f	f	f	f	f	f	f	f	INCREDIBLE SURROUND
P7	R·D·S	m	m	m	m	m	m	m	m	ELECTRIC
P8	NEWS	g	g	g	g	g	g	g	g	NEW AGE
P9	SHUFFLE	c	c	c	c	c	c	c	c	CYBER
P10	↻	e	e	e	e	e	e	e	e	DIGITAL
P11	REC	r	r	r	r	r	r	r	r	DISCO
P12	ALBUM	n	n	n	n	n	n	n	n	ARCADE
P13	DISC	d	d	d	d	d	d	d	d	CINEMA
P14	TRACK	-	-	-	-	-	col	-	-	CONCERT
P15	PROG	-	-	-	-	-	Dp	-	-	HALL
P16	TITLE	-	-	-	-	-	-	-	-	CLASSIC
P17	REP	-	-	-	-	-	-	-	-	ROCK
P18	ALL	-	-	-	-	-	-	-	-	POP
P19	▼	-	-	-	-	-	-	-	-	▲

DISPLAY BOARD - COMPONENT LAYOUT

1400 A1	2514 A5	2572 A3	3429 B2	5402 A3	6400 A3	6412 A1	9400 B4	9508 B2	9522 A5	9537 B4	9549 B3	9559 B2	9571 C2	9585 B4	9598 A5	9617 B6
1402 C6	2518 A1	2573 A3	3430 B2	5403 A2	6401 A3	6414 C2	9401 B4	9511 C5	9523 A5	9539 B3	9550 B3	9560 B2	9572 C2	9586 B4	9599 A5	
1403 B2	2525 A6	2750 A1	3431 B3	5404 A5	6402 A3	6420 A1	9446 A6	9512 B5	9526 A4	9540 B3	9551 C3	9561 B3	9574 B2	9588 B5	9601 A2	
1405 C4	2527 A2	2751 A2	3450 A2	5405 A6	6405 A3	6800 A3	9500 A2	9513 B6	9528 C3	9541 B3	9552 C3	9562 B3	9576 A1	9589 B5	9609 C4	
1406 C2	2528 A2	2800 A4	3524 C4	5406 C4	6406 B3	6801 A4	9502 B5	9515 C5	9529 C3	9542 B3	9553 C2	9563 B3	9577 A1	9590 A5	9610 C4	
1407 C5	2529 A3	2801 A4	3800 A4	5407 B5	6408 A1	6803 A4	9503 B6	9516 C5	9530 C3	9543 B3	9555 C2	9564 A4	9579 A1	9591 A5	9611 B3	
1520 A1	2530 A2	2806 A6	3801 A4	5408 C4	6409 A1	6804 A5	9505 C6	9518 B5	9532 C3	9546 B3	9556 C3	9565 A4	9580 A1	9592 C2	9612 C4	
1550 A6	2566 C4	3400 A3	3802 A4	5805 A6	6410 A1	6806 A6	9506 C4	9519 A5	9535 B4	9547 B2	9557 B2	9569 C2	9582 B3	9593 B3	9613 B2	
1805 A5	2569 B5	3406 B5	5401 A1	5806 A6	6411 A5	7800 A6	9507 A2	9521 A5	9536 B4	9548 C3	9558 B2	9570 C2	9583 A4	9596 B5	9614 B1	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6
A
B
C
3140-113-3353.02
3140-113-3353.02
7800
1805
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3802
9583
3801
9526
9591
9598
6804
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9507
6420
1520
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2518
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9601
3450
1400
9500
6405
6401
6400
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3400
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9401
9589
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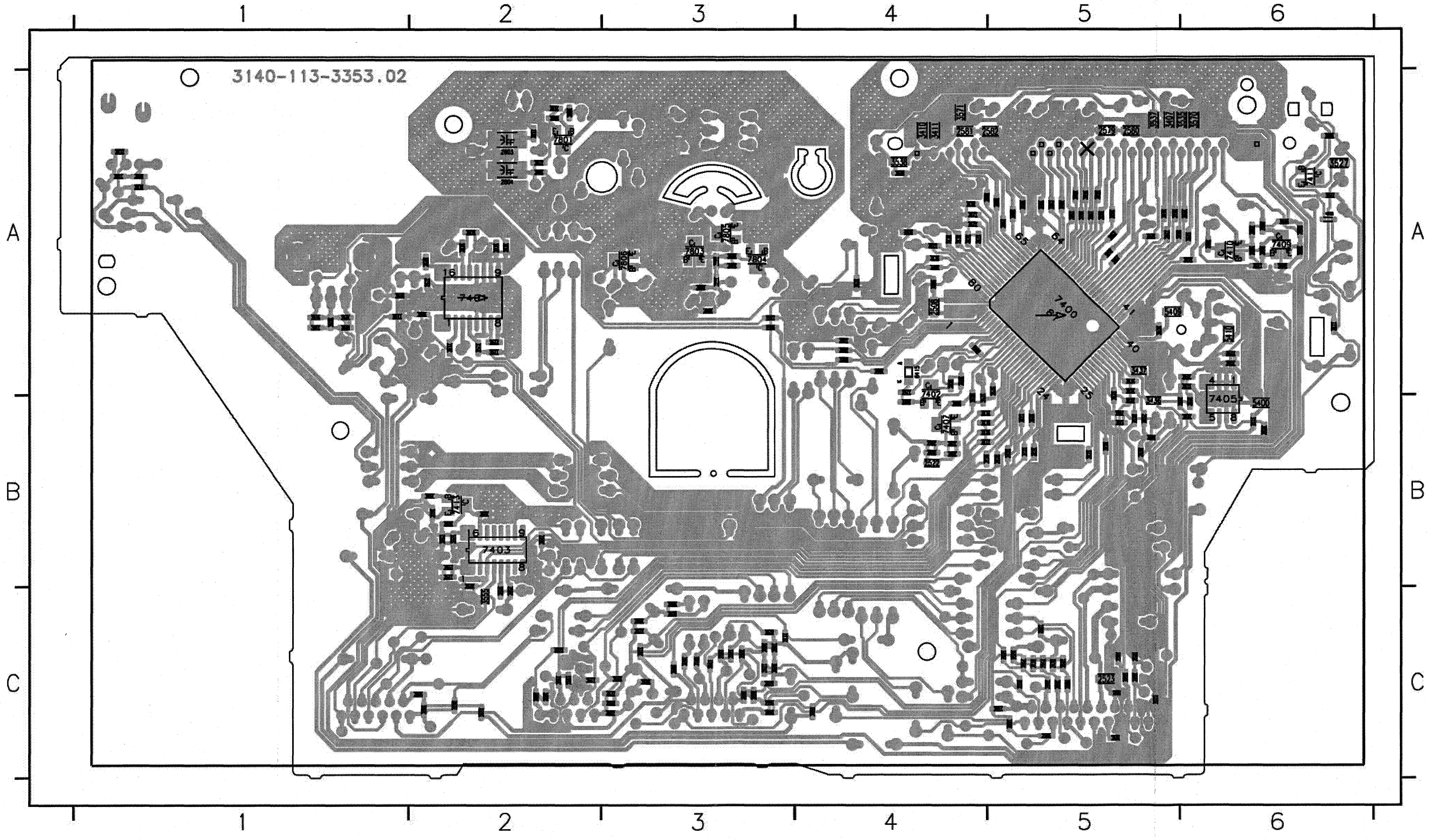
9511
9515
9516
9506
9609
9505
1402
1406
1405
1407
481
to af12
to af12
to tape
to control pcb

DISPLAY BOARD - CHIP LAYOUT

2504	A6	2524	B6	2550	C5	2567	B5	2589	A6	3413	C3	3433	B5	3449	A5	3465	A5	3485	A6	3522	C3	3541	A1	3570	A6	3590	B4	3821	A1	4520	C5	7401	A2
2505	A6	2526	A1	2551	C5	2568	A4	2803	A2	3414	B4	3434	A5	3451	A5	3466	A5	3490	C5	3523	B5	3550	B2	3571	A4	3591	B4	3822	A3	4522	C2	7402	A4
2506	A6	2531	A6	2552	C5	2574	B4	2804	A2	3415	B4	3435	A5	3452	A5	3467	A5	3491	C5	3526	C3	3551	B2	3572	C3	3595	C2	4500	A4	4523	C5	7403	B2
2507	A6	2534	A1	2553	C5	2575	A5	2808	A2	3416	B4	3436	B5	3453	A5	3468	A5	3492	C5	3527	A6	3552	B2	3574	A4	3596	C2	4501	C5	4525	A6	7405	B6
2508	A4	2535	A1	2554	C5	2576	A4	2810	A1	3417	B4	3437	A5	3454	A5	3469	A4	3502	A6	3529	B5	3553	B2	3576	C3	3804	A2	4502	B6	4526	A4	7407	B4
2511	A2	2536	B2	2555	C5	2577	A4	2812	A1	3418	B4	3438	C5	3455	A5	3470	A4	3503	A6	3530	B5	3554	B2	3577	C3	3805	A3	4505	A4	4527	A3	7409	A6
2512	A2	2541	B2	2556	C5	2578	A5	3401	A4	3419	B5	3439	C5	3456	A5	3471	A4	3505	C3	3531	A6	3555	C2	3578	C3	3806	A3	4509	A6	4528	A3	7410	A6
2513	A2	2542	B2	2557	C5	2579	A5	3402	A4	3420	B5	3441	A6	3457	A5	3472	A4	3511	A6	3532	B6	3556	C2	3579	C3	3807	A3	4511	A1	4529	C2	7411	A6
2515	A2	2543	B2	2558	C3	2580	A5	3403	A4	3421	B5	3442	A6	3458	A5	3473	A4	3515	A2	3533	A6	3557	C2	3580	C3	3808	A3	4512	A6	4530	C2	7413	B2
2516	A2	2544	B2	2559	C3	2581	A4	3404	A4	3422	B5	3443	A6	3459	A5	3474	A4	3516	A2	3534	B6	3560	C2	3581	C3	3809	A3	4513	B6	5400	B6	7801	A2
2517	A2	2545	C3	2560	C3	2582	A5	3405	C3	3423	B5	3444	A6	3460	A5	3475	A4	3517	A2	3535	A6	3561	C2	3582	C3	3810	A2	4515	A6	5409	A5	7803	A3
2520	B4	2546	C3	2561	C3	2583	C2	3407	A5	3424	B5	3445	A5	3461	A5	3476	A4	3518	A2	3537	A5	3562	C3	3583	C3	3812	A2	4516	A6	5410	A6	7804	A3
2521	B4	2547	C2	2562	C3	2584	C2	3409	B4	3425	B5	3446	A5	3462	A5	3477	A4	3519	A1	3538	A4	3563	C4	3584	C3	3813	A2	4517	B5	5411	B4	7805	A3
2522	B4	2548	C3	2563	C3	2587	B4	3410	A4	3428	B5	3447	A5	3463	A5	3479	A4	3520	A2	3539	A4	3564	C5	3585	C3	3814	A2	4518	B5	6415	A4	7806	A3
2523	C5	2549	C5	2564	C3	2588	C5	3411	A4	3432	B5	3448	A5	3464	A5	3480	A4	3521	C3	3540	A1	3565	C5	3589	B4	3820	A1	4519	C5	7400	A5		



DISPLAY BOARD - CIRCUIT DIAGRAM 1

1400	A17
1402	K21
1403	A12
1405	H21
1406	D21
1407	B21
1520	I7
1550	L18
2504	A7
2505	B7
2506	A8
2507	B9
2508	F8
2511	L1
2512	L1
2513	L1
2514	M2
2515	K4
2516	K4
2517	L6
2518	L7
2520	M8
2521	M9
2522	L10
2523	K12
2524	K12
2525	M12
2526	M12
2527	K14
2528	K14
2529	L14
2530	M14
2531	I11
2533	E19
2534	M18
2535	M19
2536	C14
2541	B15
2542	H15
2543	C16
2544	C17
2545	C19
2546	C19
2547	C19
2548	C20
2549	D20
2550	D20
2551	G19
2552	G19
2553	G20
2554	G20
2555	G20
2556	G20
2557	G18
2558	I19
2559	I19
2560	I19
2561	I20
2562	H20
2563	I20
2564	K8
2566	J8
2567	K9
2568	H10
2569	F17
2572	F7
2573	F8
2574	G10
2575	G10
2576	H10
2577	I9
2578	C13
2579	B9
2580	B10
2581	B14
2582	B14
2583	C19
2584	C19
2588	D19
2589	L12
2750	C13
2751	D13
2752	H9
3400	G8
3401	G8
3402	G9
3403	G9
3404	G9
3405	I20
3406	E17
3407	K14
3408	D20
3409	H9
3410	L14
3411	M14
3413	G7
3414	G11
3415	G11
3416	G11
3417	G11
3418	G11
3419	G11
3420	G12
3421	G12
3422	G12
3423	G12
3424	G12
3425	F13
3428	E13
3429	E13
3430	E13
3431	E13
3432	E13
3433	E13
3434	E13
3435	D13
3436	D13
3437	D13
3438	G19
3439	G19
3441	C12
3442	C12
3443	C12
3444	C12
3445	C11
3446	C11
3447	C11
3448	C11
3449	C11
3450	C11
3451	C11
3452	C10
3453	C10
3454	C10
3455	C10
3456	C10
3457	C10
3458	C10
3459	C9
3460	C9
3461	C9
3462	C9
3463	C9
3464	C9
3465	D8
3466	D8
3467	D8
3468	D8
3469	D8
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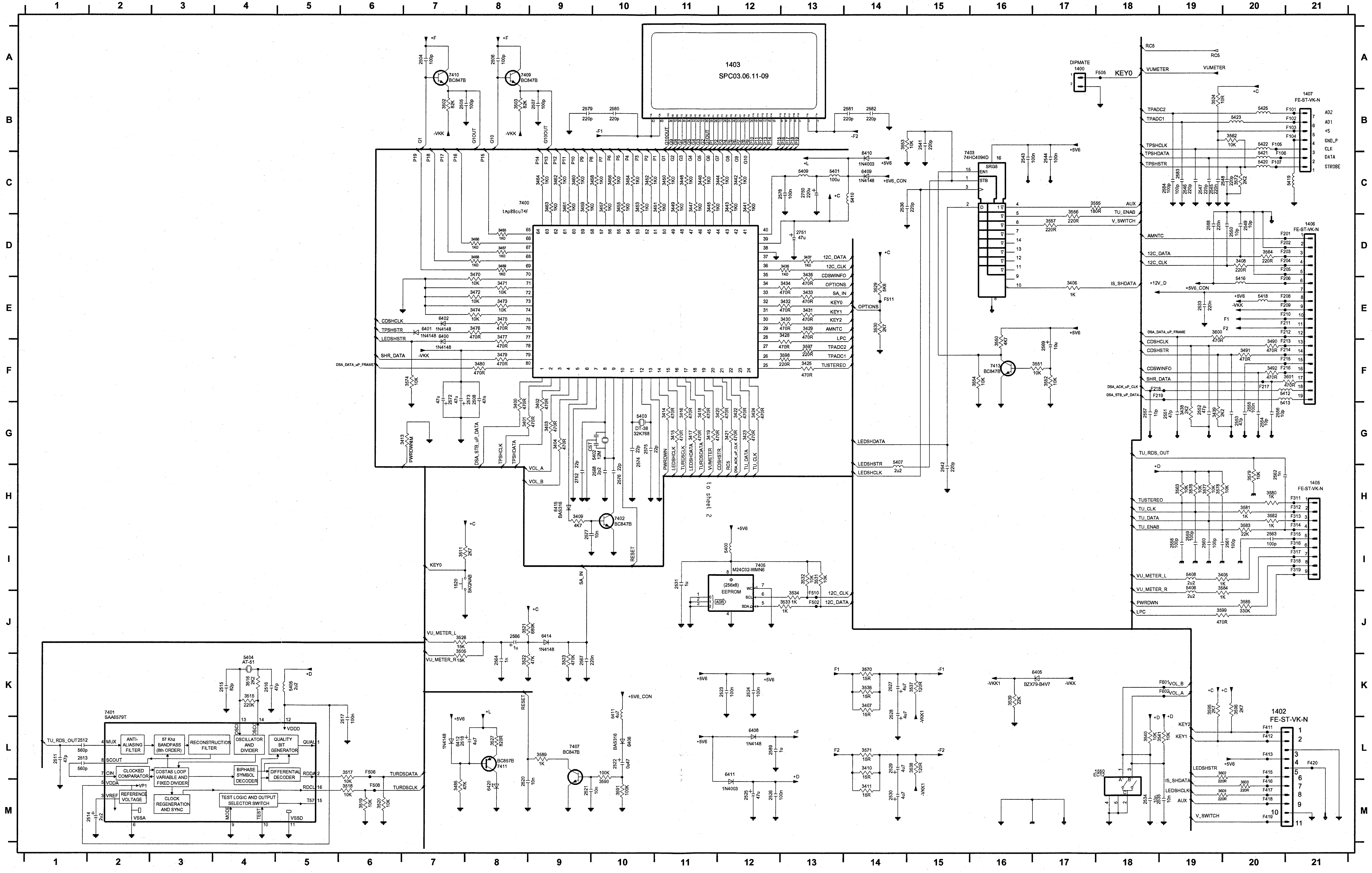
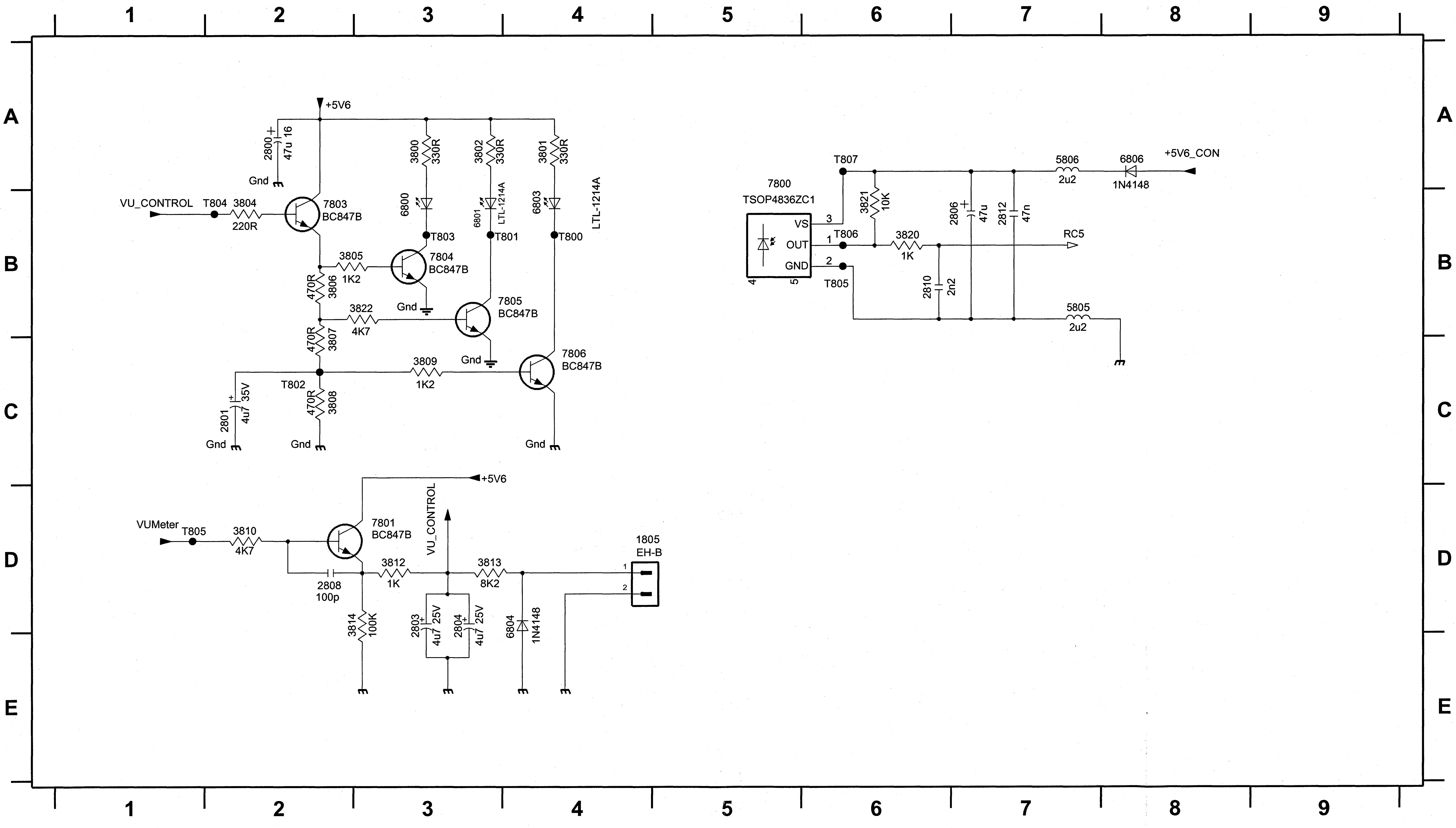
3473	E8
3474	E8
3475	E8
3476	E8
3477	E8
3479	F8
3480	F8
3485	M7
3490	F20
3491	F20
3492	F20
3502	B7
3503	B8
3505	J7
3511	I7
3515	K4
3516	K4
3517	L6
3518	M6
3519	M6
3520	M6
3521	J8
3522	K8
3523	K9
3524	B19
3526	J7
3527	L8
3529	E14
3530	E14
3531	I13
3532	I13
3533	J13
3534	J13
3535	K14
3537	K15
3538	L15
3539	K16
3540	L18
3541	L19
3550	F16
3551	F17
3552	F17
3553	B14
3554	F16
3555	C17
3556	C17
3557	D17
3562	B20
3563	H19
3564	D20
3570	K14
3571	L14
3572	C20
3574	F7
3576	H19
3577	H19
3578	H19
3579	H20
3580	H20
3581	H20
3582	H20
3583	H20
3584	I20
3585	J20
3589	L9
3590	M10
3591	M10
3595	K19
3596	K20
3597	F13
3598	F13
3599	J19
3600	E19
3601	F21
3602	L19
3603	M20
3605	M19
5400	I12
5401	C13
5402	G10
5403	G10
5404	K4
5405	K5
5406	I19
5407	G14
5408	I19
5409	C13
5410	C14
5411	K10
5412	F20
5413	G20
5416	E20
5418	E20
5419	C21
5420	C20
5421	C20
5422	B20
5423	B20
5425	B20
6400	E7
6401	E7
6402	E7
6405	K17
6406	L10
6408	L12
6409	C14
6410	C14
6411	L12
6412	L7
6414	J9
6415	H9
6420	M8
7400	C8
7401	K2
7402	H10
7403	C15
7405	I12
7407	L9
7409	A8
7410	A7
7411	L8
7413	F16
F101	B21
F102	B21
F103	B21
F104	B21
F105	B20
F106	C20
F107	C20
F201	D21
F202	D21
F203	D21
F204	D21
F205	D21
F206	E21
F208	E21
F209	E21
F210	E21
F211	E21
F212	E21
F213	F21
F214	F21
F215	F21
F216	F21
F217	F20
F218	F18
F219	F18
F311	H21
F312	H21
F313	H21
F314	H21
F315	I21
F316	I21
F317	I21
F318	I21
F319	I21
F411	L20
F412	L20
F413	L20
F415	L20
F416	M20
F417	M20
F418	M20
F419	M20
F420	L21
F502	J13
F505	A18
F506	L6
F508	M6
F510	J13
F511	E14
F601	K19
F602	K19


1403
SPC03.06.11-09
7400
tmp88cuT4f
7410 BC847B
7409 BC847B
7403 74HC4094D
SRG8
EN1
STB
DIPMATE 1400
KEY0
1407 FE-ST-VK-N
AD2
AD1
+5
GND_P
CLK
DATA
STROBE
1406 FE-ST-VK-N
1405 FE-ST-VK-N
1402 FE-ST-VK-N
7413 BC847B
7402 BC847B
7405 M24C02-WMN6
(256x8) EEPROM
7401 SAA6579T
ANTI-ALIASING FILTER
57 Khz BANDPASS (8th ORDER)
RECONSTRUCTION FILTER
OSCILLATOR AND DIVIDER
QUALITY BIT GENERATOR
CLOCKED COMPARATOR
COSTAS LOOP VARIABLE AND FIXED DIVIDER
BIPHASE SYMBOL DECODER
DIFFERENTIAL DECODER
REFERENCE VOLTAGE
CLOCK REGENERATION AND SYNC
TEST LOGIC AND OUTPUT SELECTOR SWITCH
5404 AT-51
5403 DT-38 32K768
7411 BC857B
7407 BC847B
6405 BZX79-B4V7
1520 SKQNAB
1550 EC11
TU_RDS_OUT
TURDSDATA
TURDSCLK
VU_METER_L
VU_METER_R
VOL_A
VOL_B
SA_IN
RESET
PWRDWN
LEDSHDATA
LEDSHSTR
LEDSHCLK
CDSHCLK
TPSHSTR
SHR_DATA
DSA_DATA_uP_FRAME
DSA_STB_uP_DATA
TPSHCLK
TPSHDATA
I2C_DATA
I2C_CLK
CDSWINFO
OPTIONS
KEY1
KEY2
AMNTC
LPC
TPADC1
TPADC2
TUSTEREO
TU_CLK
TU_DATA
TU_ENAB
AUX
V_SWITCH
IS_SHDATA
VUMETER
RC5
+12V_D
+5V6_CON
to sheet 2
+F
-F
+5V6
+C
+D
+L
-VKK
-VKK1
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
A B C D E F G H I J K L M

DISPLAY BOARD - CIRCUIT DIAGRAM 2

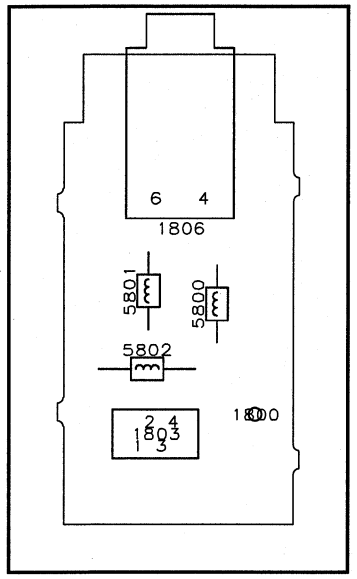
1805 D4	2803 D3	2808 D2	3800 A3	3804 B2	3807 C2	3810 D2	3814 D3	3822 B3	6800 B3	6804 D4	7801 D3	7805 B3	T801 B4	T804 B2	T806 B6
2800 A2	2804 D3	2810 B6	3801 A4	3805 B2	3808 C2	3812 D3	3820 B6	5805 B7	6801 B3	6806 A8	7803 B2	7806 C4	T802 C2	T805 D1	T807 A6
2801 C2	2806 B7	2812 B7	3802 A3	3806 B2	3809 C3	3813 D3	3821 B6	5806 A7	6803 B4	7800 A5	7804 B3	T800 B4	T803 B3	T805 B6	



1
2
3
4
5
6
7
8
9
A
B
C
D
E
+5V6
2800
47u 16
Gnd
VU_CONTROL
T804
3804
220R
7803
BC847B
3800
330R
3802
330R
3801
330R
6800
6801
LTL-1214A
6803
LTL-1214A
T803
T801
T800
3805
1K2
7804
BC847B
470R
3806
3822
4K7
Gnd
7805
BC847B
470R
3807
Gnd
7806
BC847B
3809
1K2
T802
2801
4u7 35V
470R
3808
Gnd
Gnd
Gnd
+5V6
VU_CONTROL
VUMeter
T805
3810
4K7
7801
BC847B
2808
100p
3812
1K
3813
8K2
1805
EH-B
1
2
3814
100K
2803
4u7 25V
2804
4u7 25V
6804
1N4148
T807
7800
TSOP4836ZC1
VS
OUT
GND
3
1
2
4
5
T806
T805
3821
10K
3820
1K
2810
2n2
2806
47u
2812
47n
5806
2u2
6806
1N4148
+5V6_CON
RC5
5805
2u2

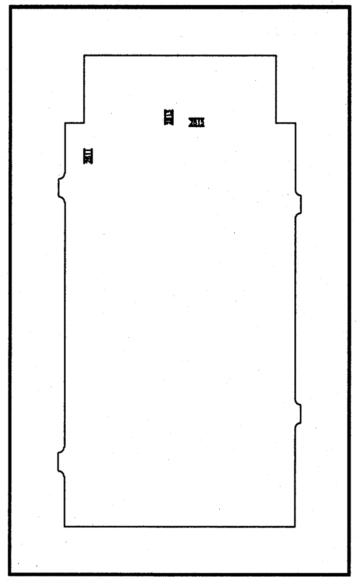
HEADPHONE BOARD - COMPONENT LAYOUT

1800 --
1803 --
1806 --
5800 --
5801 --
5802 --


6
4
1806
5801
5800
5802
2 4
1803
1 3
1800

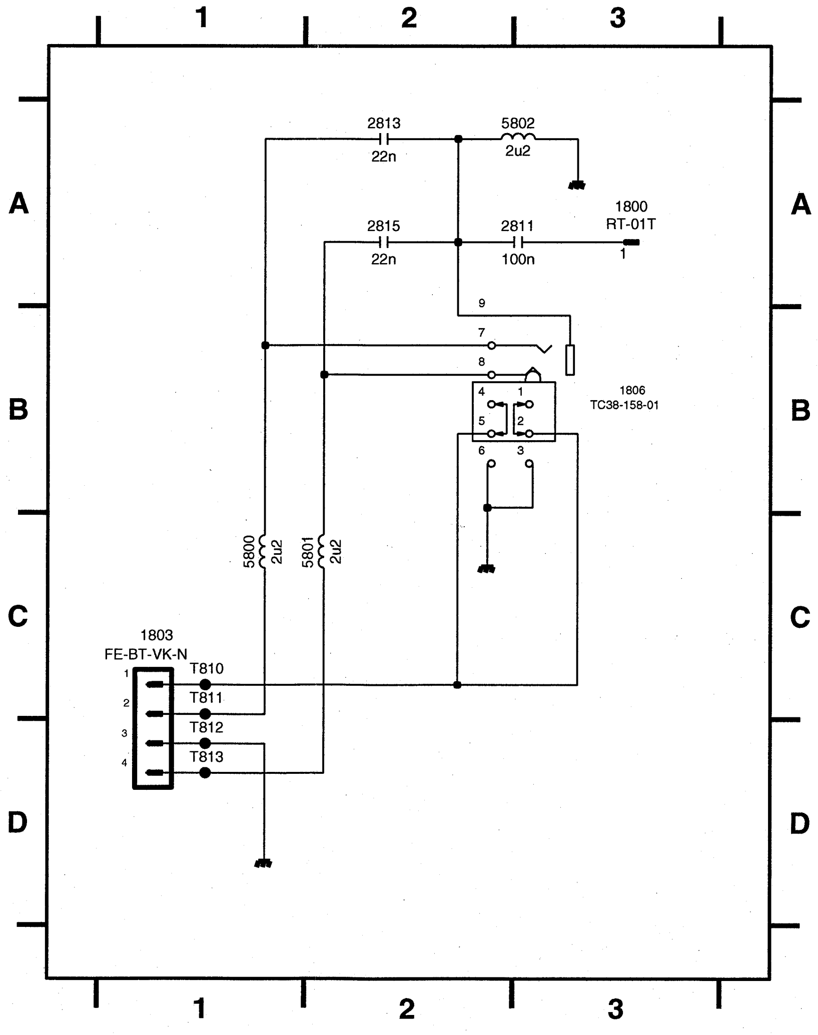
HEADPHONE BOARD - CHIP LAYOUT

2811 --
2813 --
2815 --



HEADPHONE BOARD - CIRCUIT DIAGRAM

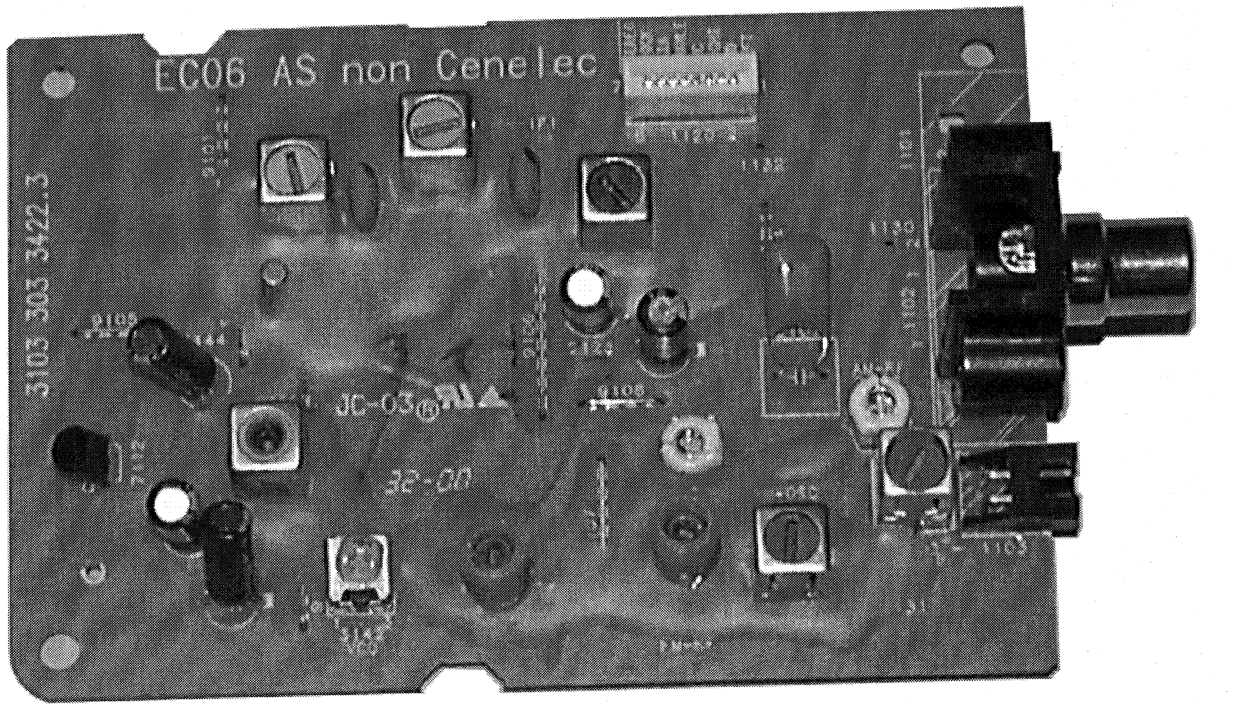
1800 A3
1803 C1
1806 B3
2811 A3
2813 A2
2815 A2
5800 C1
5801 C2
5802 A3
T810 C1
T811 C1
T812 D1
T813 D1


1
2
3
A
B
C
D
2813
22n
5802
2u2
2815
22n
2811
100n
1800
RT-01T
1
9
7
8
1806
TC38-158-01
4
1
5
2
6
3
5800
2u2
5801
2u2
1803
FE-BT-VK-N
1
2
3
4
T810
T811
T812
T813

ELECTRICAL PARTS - FRONT DISPLAY BOARD

1403	994000001853	FTD (MINI 404)
1520	482227613775	TACT SW
1550	994000001854	ROT ENCODER 24P
1806	994000001855	SOC PHONE 1P F3.5
6420	994000001859	LED BT-H202D-31-F3.5-T20
6800	994000001857	LED BT-436YOEK-31-605E-B6
6801	994000001857	LED BT-436YOEK-31-605E-B6
6803	994000001856	LED BT-H202D-30
7400	994000001858	IC TMP88CU7YF-5J06(G)
7401	935268605118	IC SAA6581T
7403	482220915449	IC 74HC4094D
7405	482281650048	IC EEPROM M24C02-WMN6TP
7800	932218597667	IR REC TSOP4836ZC1

Note: Only these parts mentioned in the list are normal service parts.


EC06 AS non Cenelec
3103 303 3422.3
JC-03
1120
1101
1102

ECO6 Tuner Board

version: ***SYSTEMS non-CENELEC***

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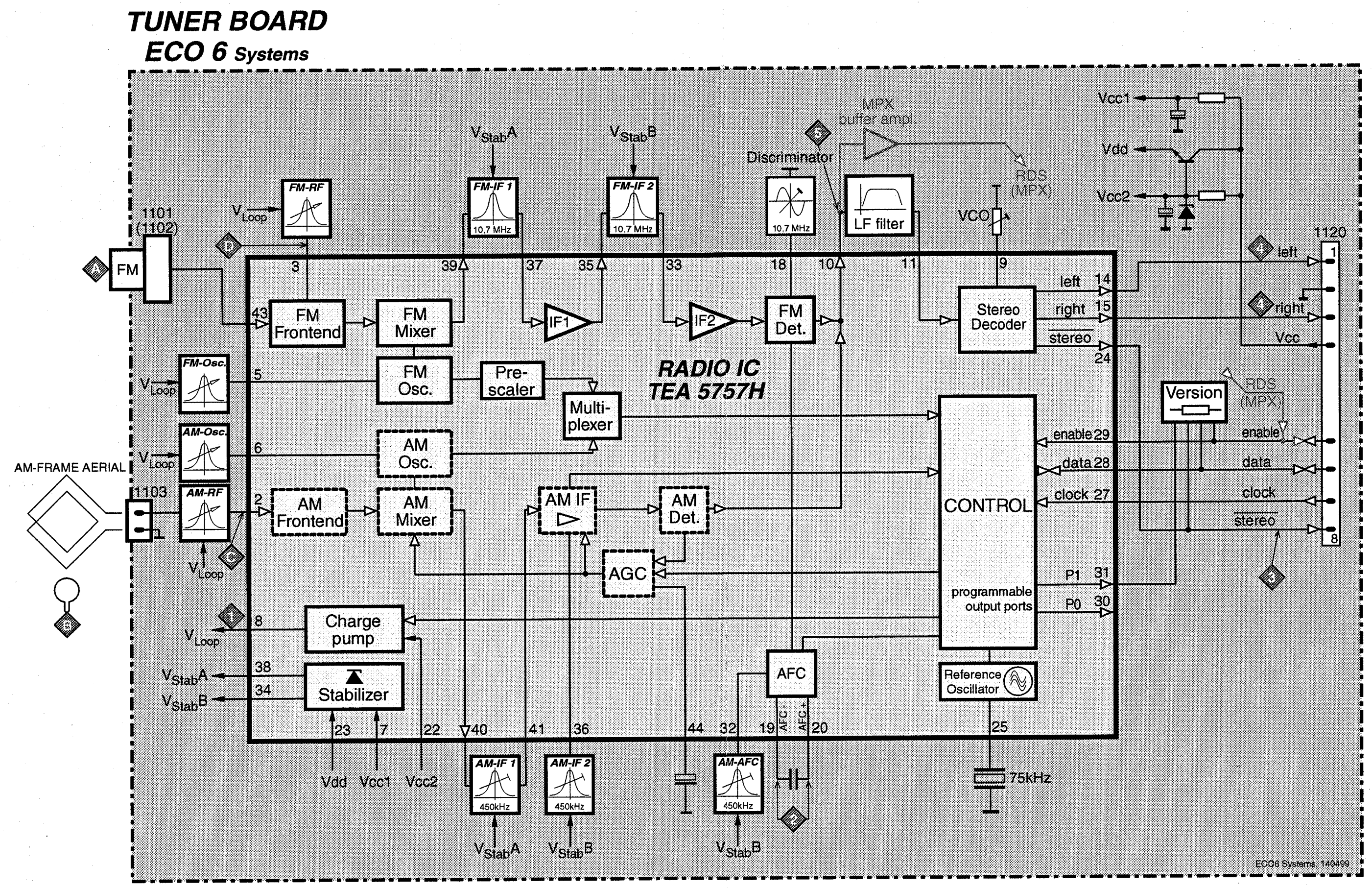
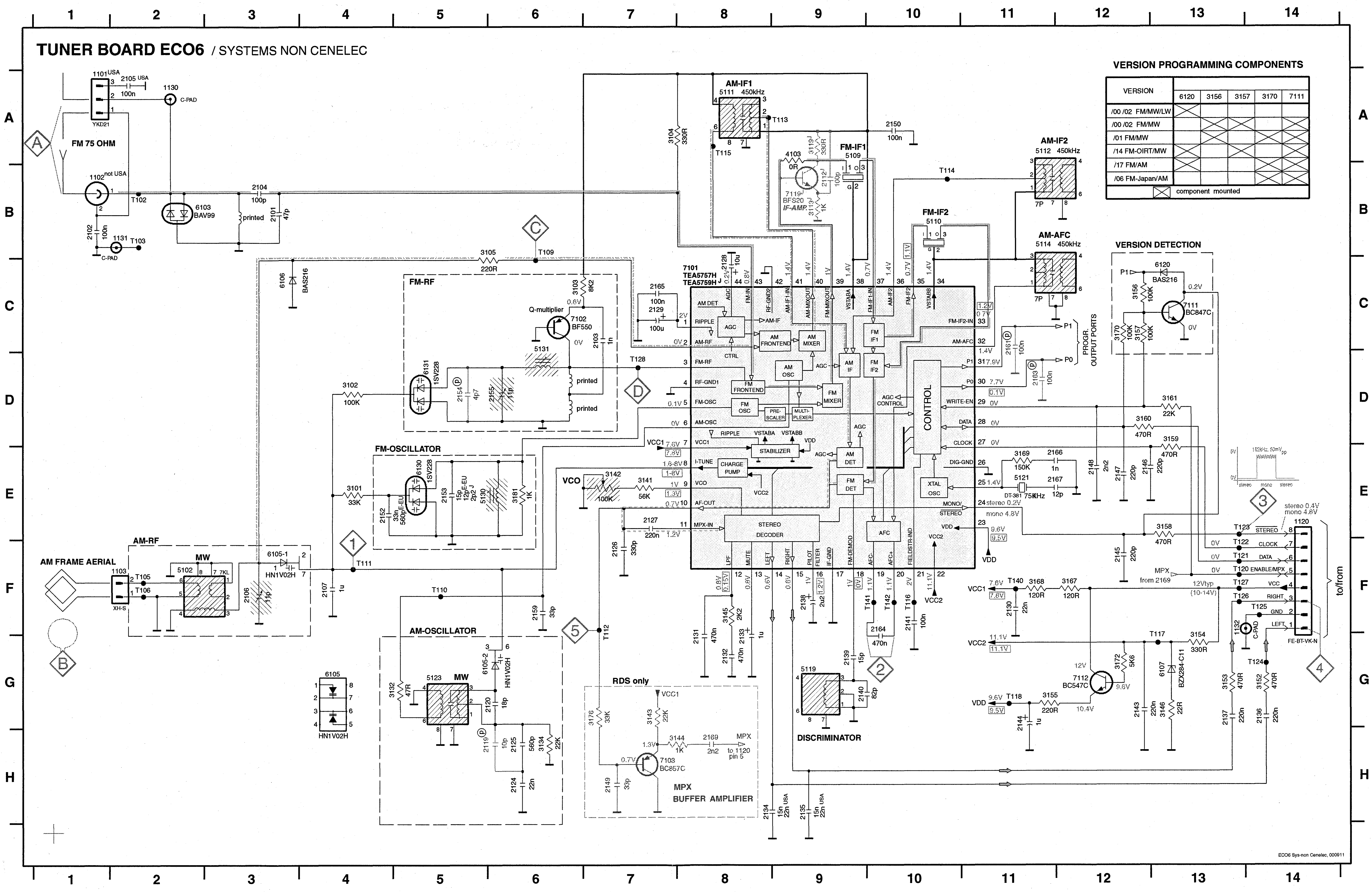
Blockdiagram 7A-1
Schematic Diagram..7A-2
Component Layout...7A-3
Adjustment table 7A-3
Electrical Partslist..7A-4

BLOCK DIAGRAM


TUNER BOARD
ECO 6 Systems
RADIO IC
TEA 5757H
FM
1101
(1102)
AM-FRAME AERIAL
1103
FM-RF
FM-Osc.
AM-Osc.
AM-RF
VLoop
VStabA
VStabB
FM-IF 1
FM-IF 2
10,7 MHz
Discriminator
MPX
buffer ampl.
RDS
(MPX)
LF filter
VCO
FM Frontend
FM Mixer
FM Osc.
Pre-scaler
Multi-plexer
IF1
IF2
FM Det.
AM Osc.
AM Frontend
AM Mixer
AM IF
AM Det.
AGC
Charge pump
Stabilizer
AFC
AFC -
AFC +
Stereo Decoder
CONTROL
programmable output ports
Reference Oscillator
75kHz
Version
Vdd
Vcc1
Vcc2
AM-IF 1
AM-IF 2
AM-AFC
450kHz
left
right
stereo
enable
data
clock
P1
P0
Vcc
1120
3
43
5
6
2
8
38
34
23
7
22
40
41
36
44
32
19
20
39
37
35
33
18
10
11
9
14
15
24
29
28
27
31
30
25
1
8
A
B
C
D
1
2
3
4
5
ECO6 Systems, 140499

TUNER BOARD ECO6 / SYSTEMS NON CENELEC


1
2
3
4
5
6
7
8
9
10
11
12
13
14
A
B
C
D
E
F
G
H
FM 75 OHM
1101 USA
2105 USA
YKD21
1130
C-PAD
1102 not USA
T102
2104 100p
6103 BAV99
printed
2101 47p
2102 100n
1131
T103
C-PAD
C
3105 220R
T109
6106 BAS216
FM-RF
3103 8K2
Q-multiplier
7102 BF550
5131
6131 1SV228
2154 4p7
2155 11p
printed
3102 100K
D
T128
FM-OSCILLATOR
6130 1SV228
2152 33n 560p E-EU
2153
5130
3181 1K
3101 33K
AM-RF
AM FRAME AERIAL
1103
T105
T106
XH-S
5102
MW
2106
6105-1 HN1V02H
2107 1u
T111
T110
B
6105 HN1V02H
AM-OSCILLATOR
3132 47R
5123 MW
6105-2 HN1V02H
2120 18p
2119 10p
2125 560p
3134 22K
2124 22n
2159 33p
5
T112
VCO
3142 100K
3141 56K
2127 220n
2126 330p
RDS only
VCC1
3176 33K
3143 22K
3144 1K
2169 2n2
MPX to 1120 pin 5
7103 BC857C
2149 33p
MPX BUFFER AMPLIFIER
3104 330R
AM-IF1
5111 450kHz
T113
T115
4103 0R
3119 330R
7119 BFS20 IF-AMP.
3113 1K
2112 100p
FM-IF1
5109
2150 100n
T114
FM-IF2
5110
AM-IF2
5112 450kHz
AM-AFC
5114 450kHz
7101 TEA5757H TEA5759H
2128 10u
2165 100n
2129 100u
AM DET
RIPPLE
AM-RF
FM-RF
RF-GND1
FM-OSC
AM-OSC
VCC1
I-TUNE
VCO
AF-OUT
MPX-IN
AGC
CTRL
FM FRONTEND
AM MIXER
AM OSC
AM IF
FM IF1
FM IF2
FM MIXER
FM OSC
PRE-SCALER
MULTI-PLEXER
AGC CONTROL
STABILIZER
CHARGE PUMP
AM DET
FM DET
AFC
STEREO DECODER
XTAL OSC
CONTROL
FM-IF2-IN
AM-AFC
P1
P0
WRITE-EN
DATA
CLOCK
DIG-GND
MONO/STEREO
VDD
VCC2
PROGR. OUTPUT PORTS
2161 100n
2163 100n
3169 150K
2166 1n
5121 DT-381 75kHz
2167 12p
2148 2n2
2147 220p
2146 220p
VERSION DETECTION
6120 BAS216
3156 100K
7111 BC847C
3170 100K
3157 100K
3161 22K
3160 470R
3159 470R
3158 470R
2145 220p
3
1120
STEREO
CLOCK
DATA
ENABLE/MPX
VCC
RIGHT
GND
LEFT
FE-BT-VK-N
to/from
T123
T122
T121
T120
T127
T126
T125
T124
1132 C-PAD
4
VCC1
T140
3168 120R
3167 120R
2130 22n
VCC2
T117
3154 330R
7112 BC547C
3172 5K6
6107 BZX284-C11
2143 220n
3146 22R
3153 470R
3152 470R
2137 220n
2136 220n
VDD
T118
3155 220R
2144 1u
2131 470n
3145 2K2
2132 470n
2133 1u
2138 2u2
T141
T142
T116
2141 100n
2164 470n
2
2139 15p
5119
2140 82p
DISCRIMINATOR
2134 15n 22n USA
2135 15n 22n USA
ECO6 Sys-non Cenelec, 000911

VERSION PROGRAMMING COMPONENTS

VERSION	6120	3156	3157	3170	7111
/00 /02 FM/MW/LW	☒				
/00 /02 FM/MW		☒	☒		☒
/01 FM/MW		☒		☒	☒
/14 FM-OIRT/MW	☒		☒		☒
/17 FM/AM	☒			☒	☒
/06 FM-Japan/AM				☒	☒

☒ component mounted

LEGEND

ⓟ...for provision only
USA ... for USA version only
E-EU ... for East European version only
J ... for Japanese version only

Ⓥ EVM
...V FM mode stereo
...V MW mode
...V LW mode
voltages measured while set is tuned to a strong transmitter

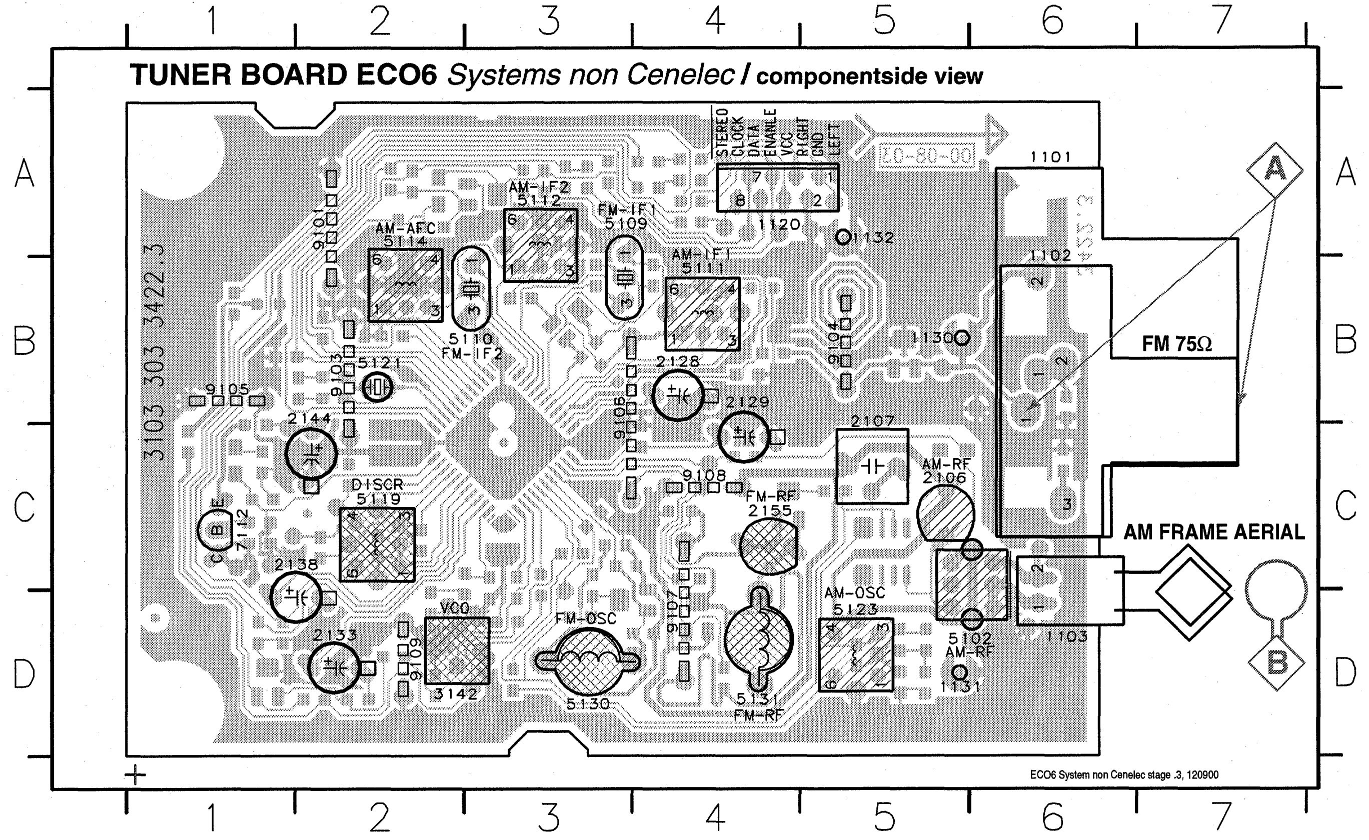
Signal path

FM
AM
MPX (Audio Frequency)
AF - left/right

1101	A1
1102	B1
1103	F2
1120	E14
1130	A2
1131	B2
1132	G13
2101	B3
2102	B1
2103	C7
2104	B3
2105	A2
2106	F3
2107	F4
2119	H6
2120	G6
2124	H6
2125	H6
2126	F7
2127	E7
2128	C8
2129	C7
2130	F11
2131	G8
2132	G8
2133	G8
2134	H8
2135	H9
2136	G14
2137	G13
2138	F9
2139	G9
2140	G9
2141	F10
2143	G12
2144	G11
2145	F12
2146	E12
2147	E12
2148	E12
2149	H7
2150	A10
2152	E4
2153	E5
2154	D5
2155	D5
2159	F6
2161	C11
2163	D11
2164	F10
2165	C7
2166	E11
2167	E11
2169	H8
3101	E4
3102	D4
3103	C6
3104	A7
3105	B6
3132	G5
3134	H6
3141	E7
3142	E7
3143	G7
3144	H7
3145	F8
3146	G13
3152	G14
3153	G13
3154	G13
3155	G11
3156	C12
3157	C12
3158	E13
3159	D13
3160	D12
3161	D13
3167	F12
3168	F11
3169	E11
3170	C12
3172	G12
3176	G7
3181	E6
5102	F2
5109	B9
5110	B10
5111	A8
5112	A11
5114	B11
5119	G9
5121	E11
5123	G5
5130	E5
5131	C6
6103	B2
6105-1	F3
6105-2	G5
6106	C3
6107	G13
6120	C13
6130	E5
6131	D5
7101	C8
7102	C6
7103	H7
7111	C13
7112	G12
T102	B2
T103	B2
T105	F2
T106	F2
T109	B6
T110	F5
T111	F4
T112	F7
T113	A8
T114	B10
T115	A8
T116	F10
T117	G13
T118	G11
T120	F13
T121	F13
T122	F13
T123	E13
T124	G14
T125	F14
T126	F13
T127	F13
T128	D7
T140	F11
T141	F10
T142	F10

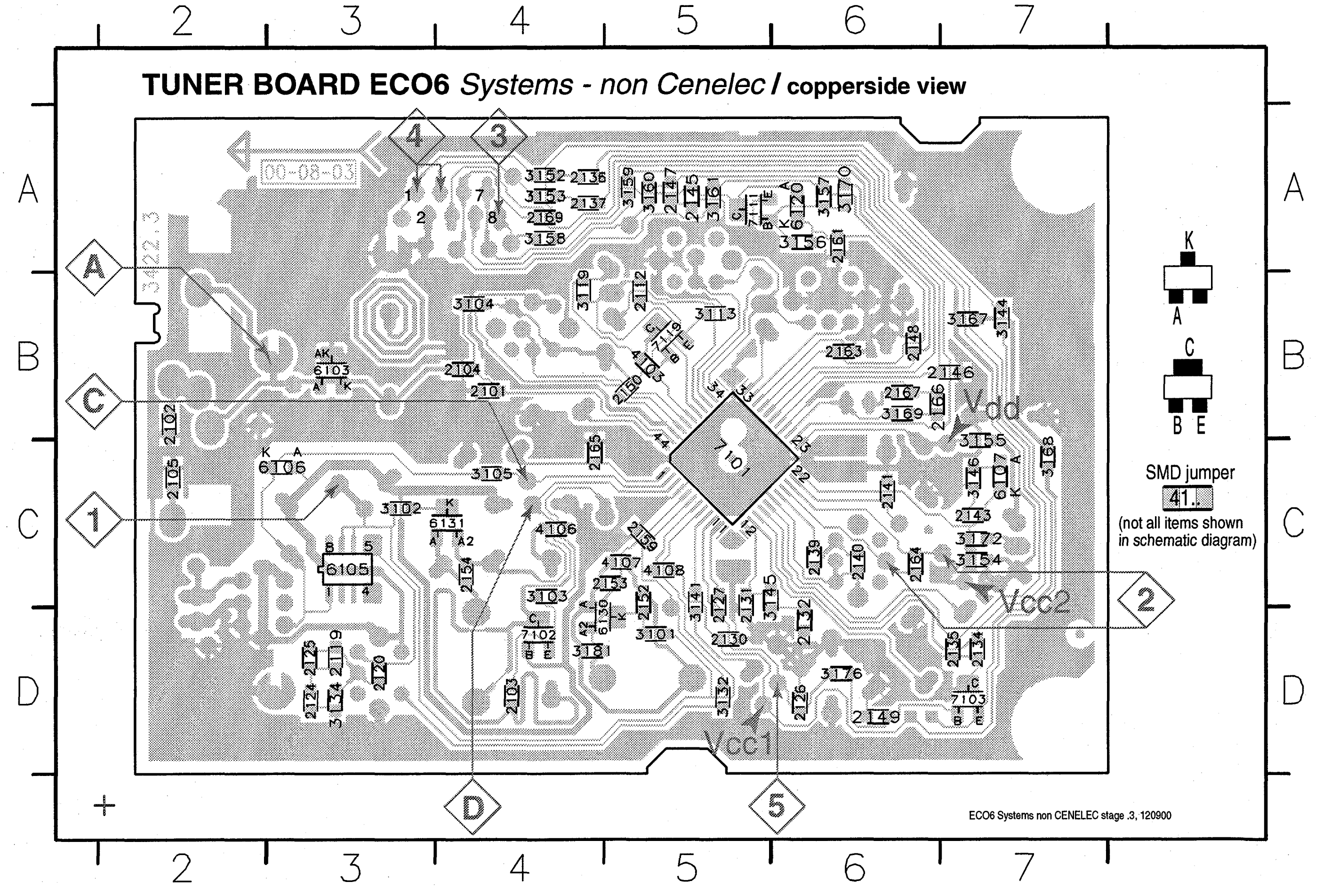
1101	A6	1120	A4	1132	A5	2128	C4	2138	C2	3142	D2	5110	B3	5114	A2	5123	D5	7112	C1	9104	B5	9107	D4
1102	B6	1130	B5	2106	C5	2129	B4	2144	B2	5102	D6	5111	B4	5119	C2	5130	D3	9101	A2	9105	B1	9108	C4
1103	D6	1131	D5	2107	B5	2133	D2	2155	C4	5109	A3	5112	A3	5121	B2	5131	D4	9103	B2	9106	B3	9109	D2

TUNER BOARD ECO6 *Systems non Cenelec* / componentside view


1
2
3
4
5
6
7
A
B
C
D
STEREO
CLOCK
DATA
ENABLE
VCC
RIGHT
GND
LEFT
1101
1120
1132
1102
1130
1131
1103
AM-IF2
5112
FM-IF1
5109
AM-AFC
5114
AM-IF1
5111
5110
FM-IF2
5121
9101
9104
9105
9106
2128
2129
2144
2107
AM-RF
2106
DISCR
5119
9108
FM-RF
2155
7112
2138
2133
9109
VCO
3142
FM-OSC
5130
9107
5131
FM-RF
AM-OSC
5123
5102
AM-RF
FM 75Ω
AM FRAME AERIAL
3103 303 3422.3
ECO6 System non Cenelec stage .3, 120900

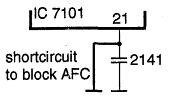
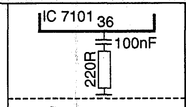
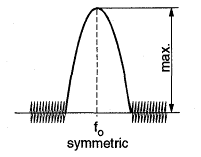
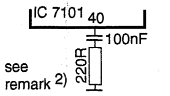
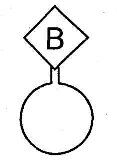
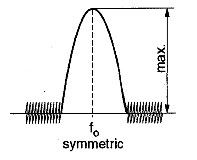
2101	B4	2119	D3	2130	D5	2137	A4	2146	B7	2153	C5	2165	C4	3103	C4	3134	D3	3152	A4	3158	A4	3169	B6	4106	C4	6107	C7	7103	D7
2102	B1	2120	D3	2131	C5	2139	C6	2147	A5	2154	C4	2166	B6	3104	B4	3141	C5	3153	A4	3159	A5	3170	A6	4107	C5	6120	A6	7111	A5
2103	D4	2124	D3	2132	D6	2140	C6	2148	B6	2159	C5	2167	B6	3105	C4	3143	D6	3154	C7	3160	A5	3172	C7	4108	C5	6130	D4	7119	B5
2104	B4	2125	D3	2134	D7	2141	C6	2149	D6	2161	A6	2169	A4	3113	B5	3144	B7	3155	C7	3161	A5	3176	D6	6103	B3	6131	C4		
2105	C1	2126	D6	2135	D7	2143	C7	2150	B5	2163	B6	3101	D5	3119	B5	3145	C5	3156	A6	3167	B7	3181	D4	6105	C3	7101	C5		
2112	B5	2127	C5	2136	A4	2145	A5	2152	C5	2164	C6	3102	C3	3132	D5	3146	C7	3157	A6	3168	C7	4103	B5	6106	C3	7102	D4		

TUNER BOARD ECO6 *Systems - non Cenelec* / copperside view


2
3
4
5
6
7
A
B
C
D
4
3
A
C
1
2
D
5
7101
Vdd
Vcc2
Vcc1
K
A
C
B E
SMD jumper
41.
(not all items shown in schematic diagram)
ECO6 Systems non CENELEC stage .3, 120900

These assembly drawings show a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

TUNER ADJUSTMENT TABLE (ECO6 FM/MW- and FM/MW/LW - versions with AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130	◇1	8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
MW FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
LW			279kHz	5122		8V ±0.2V
153 - 279kHz			153kHz	check		1.1V ±0.4V
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
FM IF						
FM	10.7MHz, 45mV continuous wave	◇D	 IC 7101 21 shortcircuit to block AFC 2141	5119	◇2	0 ± 3 mV DC
FM RF						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	◇A	108MHz	2155	◇4	MAX ↕
	87.5MHz (65.81MHz)	mod=1kHz Δf=±22.5kHz	87.5MHz (65.81MHz)	5131		
VCO						
FM	98MHz, 1mV continuous wave	◇A	98MHz	3142	◇3	152kHz ±1kHz [1]
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with 3.3kΩ to Vcc	◇C Δf=±10kHz V_{RF} = 0.5mV (as low as possible)	 IC 7101 36 100nF 220R	5111	◇5	 max. f_o symmetric
			 IC 7101 40 100nF 220R see remark [2]	5112		
AM AFC **MW**		◇C continuous wave V_{RF} = 2mV		5114	◇2	0 ± 2 mV DC
AM RF [3]						
MW [4] FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz	 B	1494kHz	2106	◇5	 max. f_o symmetric ↕
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz	Δf = ±30kHz V_{RF} as low as possible	1500kHz	2106		↕
	560kHz		560kHz	5102		

ECO6, Sys + PA with frame aerial, 070799

Use Service Testprogram. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

[1] If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

[2] RC network serves for damping the IF-filter while adjusting the other one.

[3] For AM RF adjustments the original frame antenna has to be used !

[4] MW has to be aligned before LW.

↕ Repeat

Electrical Partslist *ECO6* *SYSTEMS NON-CENELEC*

MISCELLANEOUS

1101	2422 015 19376	SOCKET 2P CLICKFIT	USA only
1102	4822 267 10283	SOCKET COAX, IEC 75Ω	not USA
1103	4822 265 31184	JST CONNECTOR 2 POLE	
1120	4822 265 11515	FFC SOCKET, 8P	

CAPACITORS

2101©	4822 126 13692	47pF	1%	63V	
2102©	4822 126 13838	100nF	10%	50V	not USA
2103©	5322 122 31647	1nF	10%	63V	
2104©	5322 122 32531	100pF	5%	50V	
2105©	4822 126 13838	100nF	10%	50V	USA only
2106	2020 800 00191	3-11pF TRIMCAP.,N450			
2107	4822 121 51319	1µF	20%	50V	
2120©	4822 126 13689	18pF	1%	63V	
2124©	5322 122 32654	22nF	10%	63V	
2125©	2020 552 96199	560pF	1%	50V	
2126©	5322 122 31863	330pF	5%	50V	
2127©	4822 126 14076	220nF	20%	25V	
2128	4822 124 40248	10µF	20%	63V	
2129	4822 124 41584	100µF	20%	10V	
2130©	5322 122 32654	22nF	10%	63V	
2131©	4822 126 13482	470nF	20%	16V	
2132©	4822 126 13482	470nF	20%	16V	
2133	4822 124 21913	1µF	20%	63V	
2134©	4822 126 13188	15nF	5%	63V	not USA
2134©	5322 122 32654	22nF	10%	63V	USA only
2135©	4822 126 13188	15nF	5%	63V	not USA
2135©	5322 122 32654	22nF	10%	63V	USA only
2136©	4822 126 14076	220nF	20%	25V	
2137©	4822 126 14076	220nF	20%	25V	
2138	4822 124 22652	2,2µF	20%	50V	
2139©	4822 126 14236	15pF	5%	50V	
2140©	4822 126 13695	82pF	1%	63V	
2141©	4822 126 13838	100nF	10%	50V	
2143©	4822 126 14076	220nF	20%	25V	
2144	4822 124 21913	1µF	20%	63V	
2145©	4822 122 33575	220pF	5%	50V	
2146©	4822 122 33575	220pF	5%	50V	
2147©	4822 122 33575	220pF	5%	50V	
2148©	4822 122 33127	2,2nF	10%	63V	
2149©	5322 122 32659	33pF	5%	50V	RDS only
2150©	4822 126 13838	100nF	10%	50V	
2152©	4822 126 12105	33nF	5%	63V	not for East Europe
2152©	5322 116 80853	560pF	5%	63V	for East Europe only
2153©	4822 126 13486	15pF	2%	63V	not for East Europe
2153©	4822 122 33926	12pF	2%	50V	for East Europe only
2155	2020 800 00191	3-11pF TRIMCAP.,N450			
2159©	5322 122 32659	33pF	5%	50V	
2164©	4822 126 13482	470nF	20%	16V	
2165©	4822 126 13838	100nF	10%	50V	
2166©	5322 122 31647	1nF	10%	63V	
2167©	4822 122 33926	12pF	5%	50V	
2169©	4822 122 33127	2,2nF	10%	63V	RDS only

RESISTORS

3101©	4822 051 20333	33kΩ	5%	0,1W	
3102©	4822 117 10837	100kΩ	1%	0,1W	
3103©	4822 051 20822	8,2kΩ	5%	0,1W	
3104©	4822 117 13577	330Ω	1%	0,1W	
3105©	4822 117 11503	220Ω	5%	0,1W	
3132©	4822 051 20479	47Ω	5%	0,1W	
3134©	4822 051 20223	22kΩ	5%	0,1W	
3141©	4822 117 11148	56kΩ	1%	0,1W	
3142	4822 100 12159	TRIMPOT. 100kΩ			

RESISTORS

3143©	4822 051 20223	22kΩ	5%	0,1W	RDS only
3144©	4822 051 10102	1kΩ	2%	0,25W	RDS only
3145©	4822 117 11449	2,2kΩ	1%	0,1W	
3146©	4822 051 20229	22Ω	5%	0,1W	
3152©	4822 051 20471	470Ω	5%	0,1W	
3153©	4822 051 20471	470Ω	5%	0,1W	
3154©	4822 117 13577	330Ω	1%	0,1W	
3155©	4822 117 11503	220Ω	5%	0,1W	
3156©	4822 117 10837	100kΩ	1%	0,1W	
3157©	4822 117 10837	100kΩ	1%	0,1W	
3158©	4822 051 20471	470Ω	5%	0,1W	
3159©	4822 051 20471	470Ω	5%	0,1W	
3160©	4822 051 20471	470Ω	5%	0,1W	
3161©	4822 051 20223	22kΩ	5%	0,1W	
3167©	4822 051 20121	120Ω	5%	0,1W	
3168©	4822 051 20121	120Ω	5%	0,1W	
3169©	4822 051 20154	150kΩ	5%	0,1W	
3170©	4822 117 10837	100kΩ	1%	0,1W	
3172©	4822 051 20562	5,6kΩ	5%	0,1W	
3176©	4822 051 20333	33kΩ	5%	0,1W	RDS only
3181©	4822 051 10102	1kΩ	2%	0,25W	
4103©	4822 051 20008	CHIP JUMPER 0805			
4106©	4822 051 20008	CHIP JUMPER 0805			
4107©	4822 051 20008	CHIP JUMPER 0805			
4108©	4822 051 20008	CHIP JUMPER 0805			

COILS

5102	4822 157 71634	RF-COIL MW
5109	4822 242 70665	FM-IF FILTER 10,7MHz
5110	4822 242 70665	FM-IF FILTER 10,7MHz
5111	2422 549 44023	AM-IF FILTER 450kHz
5112	4822 157 70302	AM-IF FILTER 450kHz
5114	4822 157 70302	AM-IF FILTER 450kHz
5119	4822 157 11443	DISCRIMINATOR COIL
5121	4822 242 10261	QUARTZ 75kHz
5123	2422 549 44108	RF-COIL, AM-OSCILLATOR
5130	4822 157 11843	RF COIL 1,5 TURNS
5131	4822 157 11843	RF COIL 1,5 TURNS

DIODES

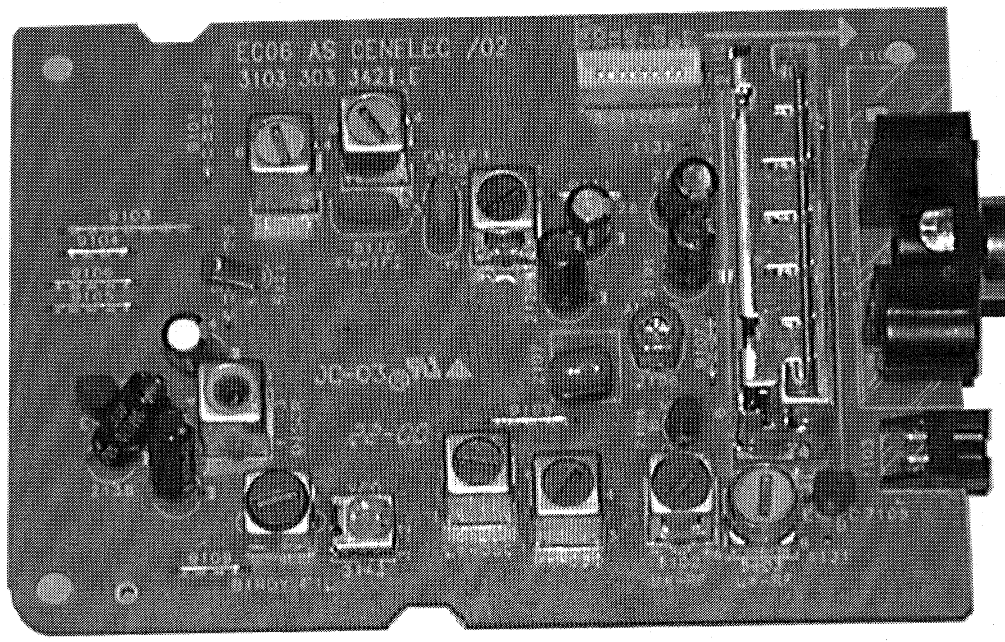
6103©	5322 130 34337	BAV99
6105©	4822 130 83075	HN1V02H
6106©	4822 130 83757	BAS216
6107©	9340 386 90115	BZX284-C11
6120©	4822 130 83757	BAS216
6130©	4822 130 82833	1SV228
6131©	4822 130 82833	1SV228

TRANSISTORS

7102	4822 130 42131	BF550	
7103©	5322 130 42756	BC857C	RDS only
7111©	5322 130 42755	BC847C	
7112	4822 130 44503	BC547C	

INTEGRATED CIRCUITS

7101©	9351 740 80557	TEA5757H/V1, RADIO IC


ECO6 AS CENELEC /02
3103 303 3421.E

ECO6 Tuner Board

version: ***SYSTEMS CENELEC***

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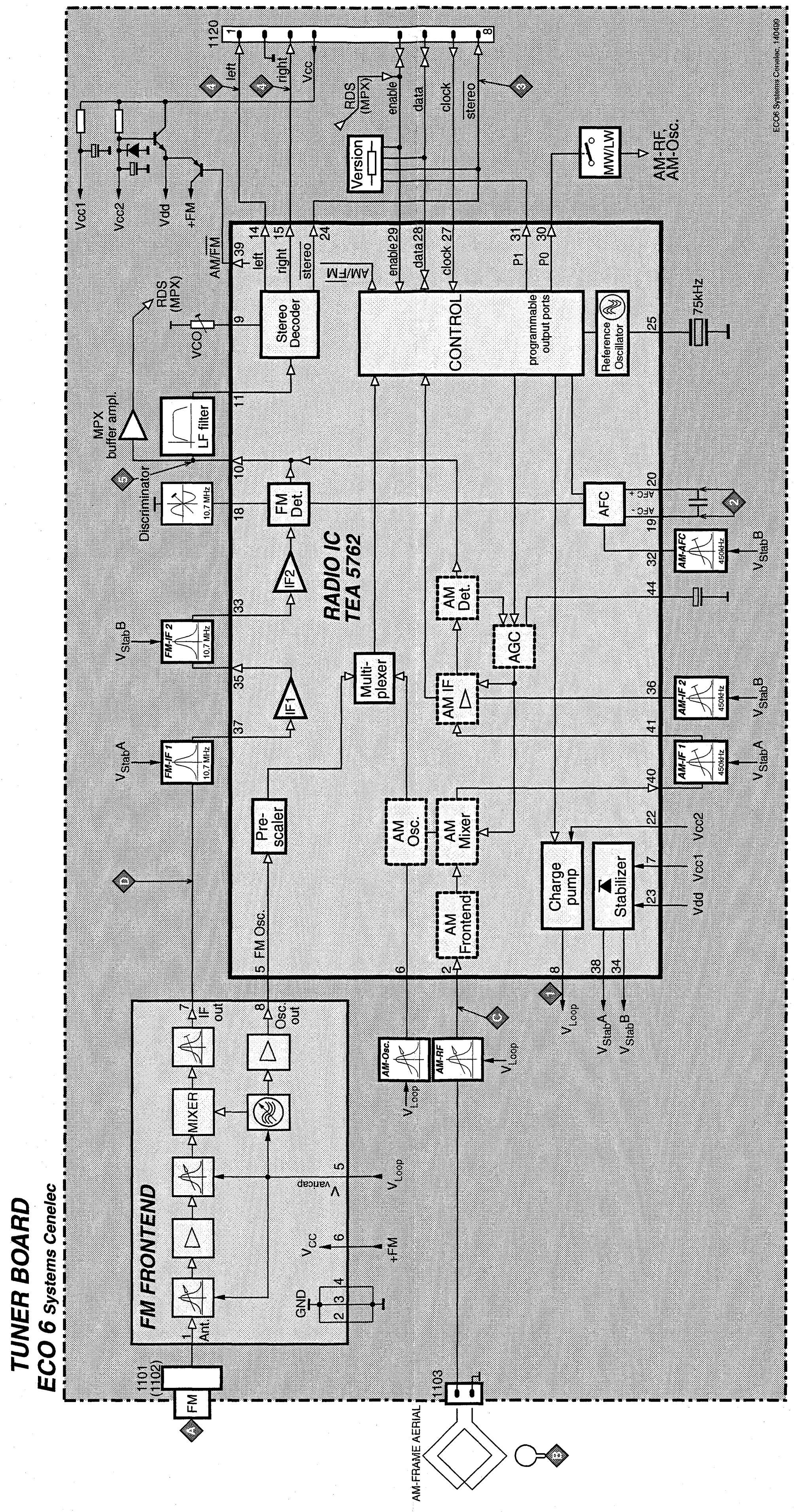
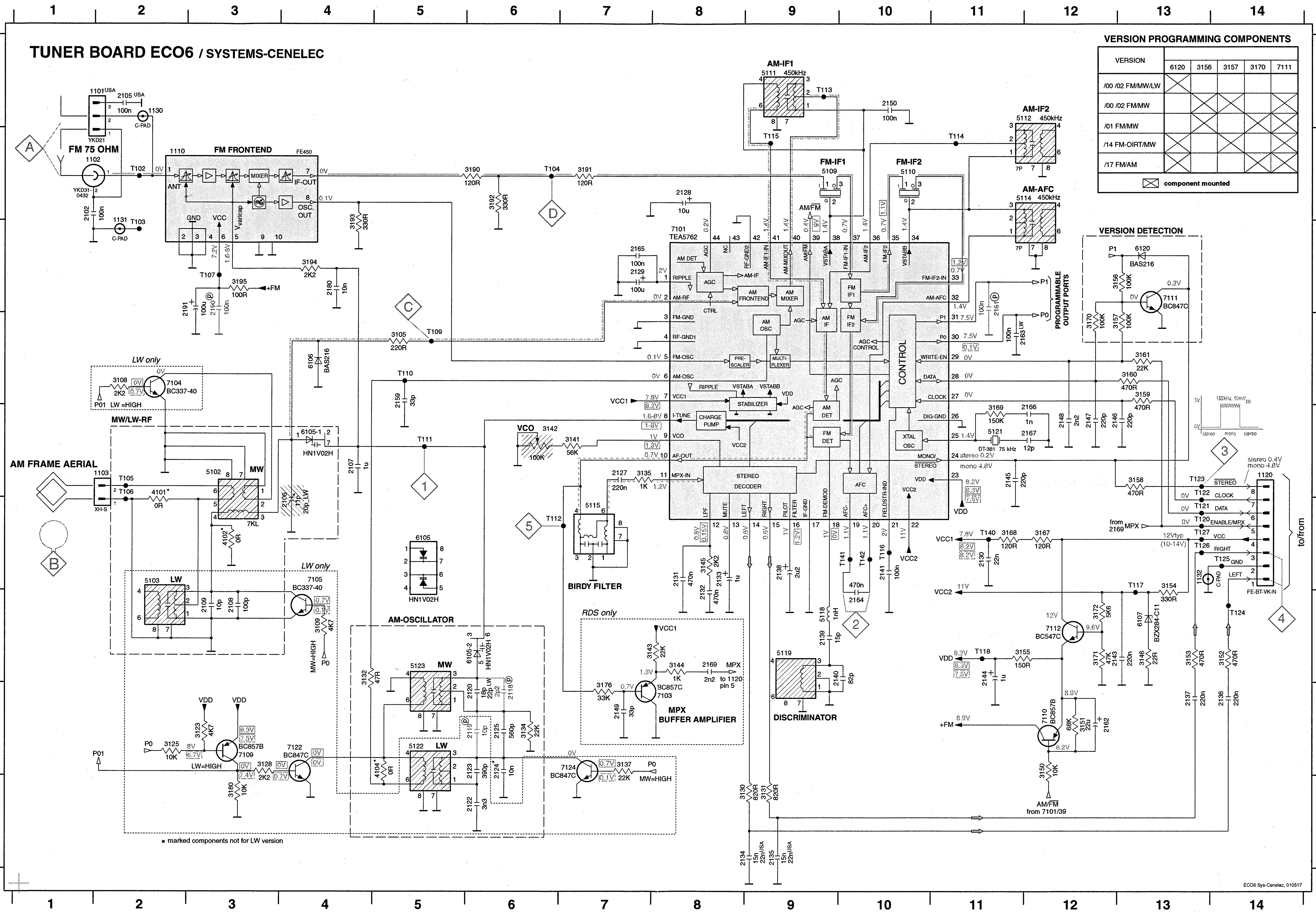
Component Layout..7B-3
Adjustment table 7B-3
Electrical Partslist..7B-4

BLOCK DIAGRAM


TUNER BOARD
ECO 6 Systems Cenelec
RADIO IC
TEA 5762
FM FRONTEND
Ant.
MIXER
IF out
Osc. out
GND
Vcc
+FM
Vvaricap
VLoop
1101 (1102)
FM
1103
AM-FRAME AERIAL
1120
left
right
Vcc
RDS (MPX)
enable
data
clock
stereo
Version
MW/LW
AM-RF
AM-Osc.
Vcc1
Vcc2
Vdd
+FM
AM/FM
Stereo Decoder
CONTROL
programmable output ports
Reference Oscillator
75kHz
VCO
MPX buffer ampl.
LF filter
Discriminator
10.7 MHz
FM Det.
IF2
IF1
FM-IF 2
FM-IF 1
VStabA
VStabB
AFC
AM-AFC
AM Det.
AGC
Multi-plexer
AM IF
AM-IF 2
AM-IF 1
450kHz
Pre-scaler
5 FM Osc.
AM Osc.
AM Mixer
AM Frontend
Charge pump
Stabilizer
P1
P0
ECO6 Systems Cenelec 140499

TUNER BOARD ECO6 / SYSTEMS-CENELEC


VERSION PROGRAMMING COMPONENTS
VERSION
6120
3156
3157
3170
7111
/00 /02 FM/MW/LW
/00 /02 FM/MW
/01 FM/MW
/14 FM-OIRT/MW
/17 FM/AM
component mounted
FM 75 OHM
FM FRONTEND
FE450
MIXER
IF-OUT
OSC. OUT
AM-IF1
5111 450kHz
AM-IF2
5112 450kHz
AM-AFC
5114 450kHz
FM-IF1
5109
FM-IF2
5110
7101
TEA5762
AM DET
AGC
AM FRONTEND
AM MIXER
AM OSC
PRE-SCALER
MULTI-PLEXER
STABILIZER
CHARGE PUMP
STEREO DECODER
CONTROL
XTAL OSC
AFC
FM DET
AM DET
PROGRAMMABLE OUTPUT PORTS
VERSION DETECTION
LW only
MW/LW-RF
AM FRAME AERIAL
MW
LW
7KL
AM-OSCILLATOR
VCO
BIRDY FILTER
RDS only
MPX BUFFER AMPLIFIER
DISCRIMINATOR
DT-381 75 kHz
to/from
FE-BT-VK-N
STEREO
CLOCK
DATA
ENABLE/MPX
VCC
RIGHT
GND
LEFT
stereo 0.4V
mono 4.8V
MW=HIGH
LW=HIGH
AM/FM from 7101/39
* marked components not for LW version
ECO6 Sys-Cenelec, 010517

LEGEND

* ... only assembled in FM/AM-version
ⓟ...for provision only
USA ... for USA version only
LW ... for LW version only

SMD jumper
41xx
0R

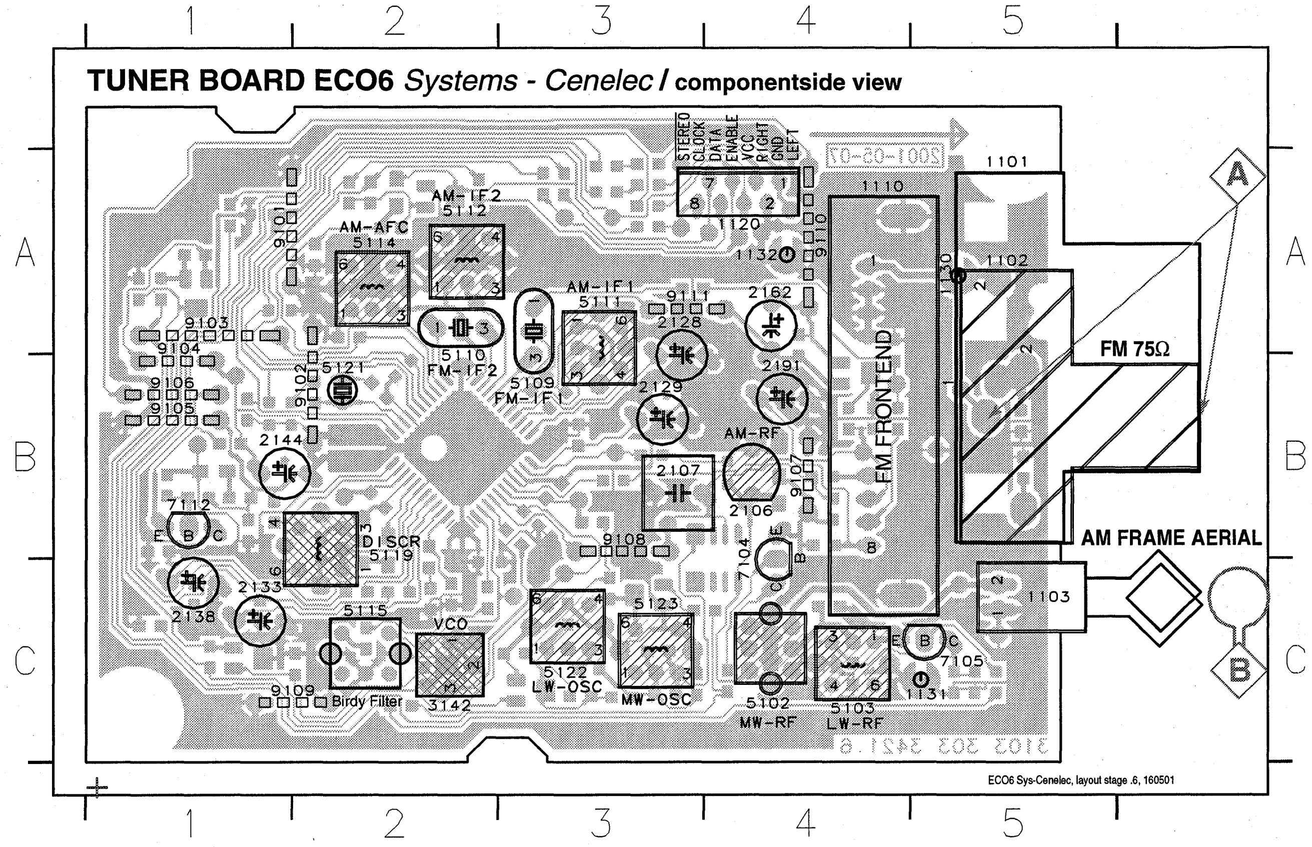
EVM

...V FM mode stereo
...V MW mode
...V LW mode
voltages measured while
set is tuned to a strong transmitter

Signal path
FM
AM
MPX (Audio Frequency)
AF - left/right

1101	A2
1102	B1
1103	E2
1110	B2
1120	E14
1130	A2
1131	C2
1132	F13
2102	B1
2105	A2
2106	E3
2107	E4
2108	G3
2109	G3
2118	H6
2119	H6
2120	H6
2122	I6
2123	H6
2124	H6
2125	H6
2127	E7
2128	B8
2129	C7
2130	F11
2131	F8
2132	F8
2133	F8
2134	I8
2135	I9
2136	H14
2137	H13
2138	F9
2139	G9
2140	G9
2141	F10
2143	G12
2144	G11
2145	E11
2146	E12
2147	E12
2148	E12
2149	H7
2150	A10
2159	D5
2161	C11
2162	H12
2163	D11
2164	G10
2165	C7
2166	E11
2167	E11
2169	G8
2180	C4
2190	C3
2191	C3
3105	D5
3108	D2
3109	G4
3123	H3
3125	H2
3128	H3
3130	I9
3131	I9
3132	G4
3134	H6
3135	E7
3137	H7
3141	E7
3142	E6
3143	G7
3144	G8
3145	F8
3146	G13
3150	H12
3151	H12
3152	G14
3153	G13
3154	F13
3155	G12
3156	C12
3157	D12
3158	E13
3159	D13
3160	D13
3161	D13
3167	F12
3168	F11
3169	E11
3170	D12
3171	G12
3172	G12
3176	H7
3180	I3
3190	B6
3191	B7
3192	B6
3193	B4
3194	C4
3195	C3
4101	E2
4102	F3
4104	H5
5102	E3
5103	F2
5109	B9
5110	B10
5111	A9
5112	A11
5114	B11
5115	E7
5118	G9
5119	G9
5121	E11
5122	H5
5123	G5
6105-1	E4
6105-2	G6
6106	D4
6107	G13
6120	C13
7101	C8
7103	H8
7104	D2
7105	F4
7109	H3
7110	H12
7111	C13
7112	G12
7122	H4
7124	H7
T102	B2
T103	B2
T104	B6
T105	E2
T106	E2
T107	C3
T109	D5
T110	D5
T111	E5
T112	F7
T113	A9
T114	B11
T116	F10
T117	F13
T118	G11
T120	F13
T121	F13
T122	E13
T123	E13
T124	G14
T125	F14
T126	F13
T127	F13
T140	F11
T141	F10
T142	F10

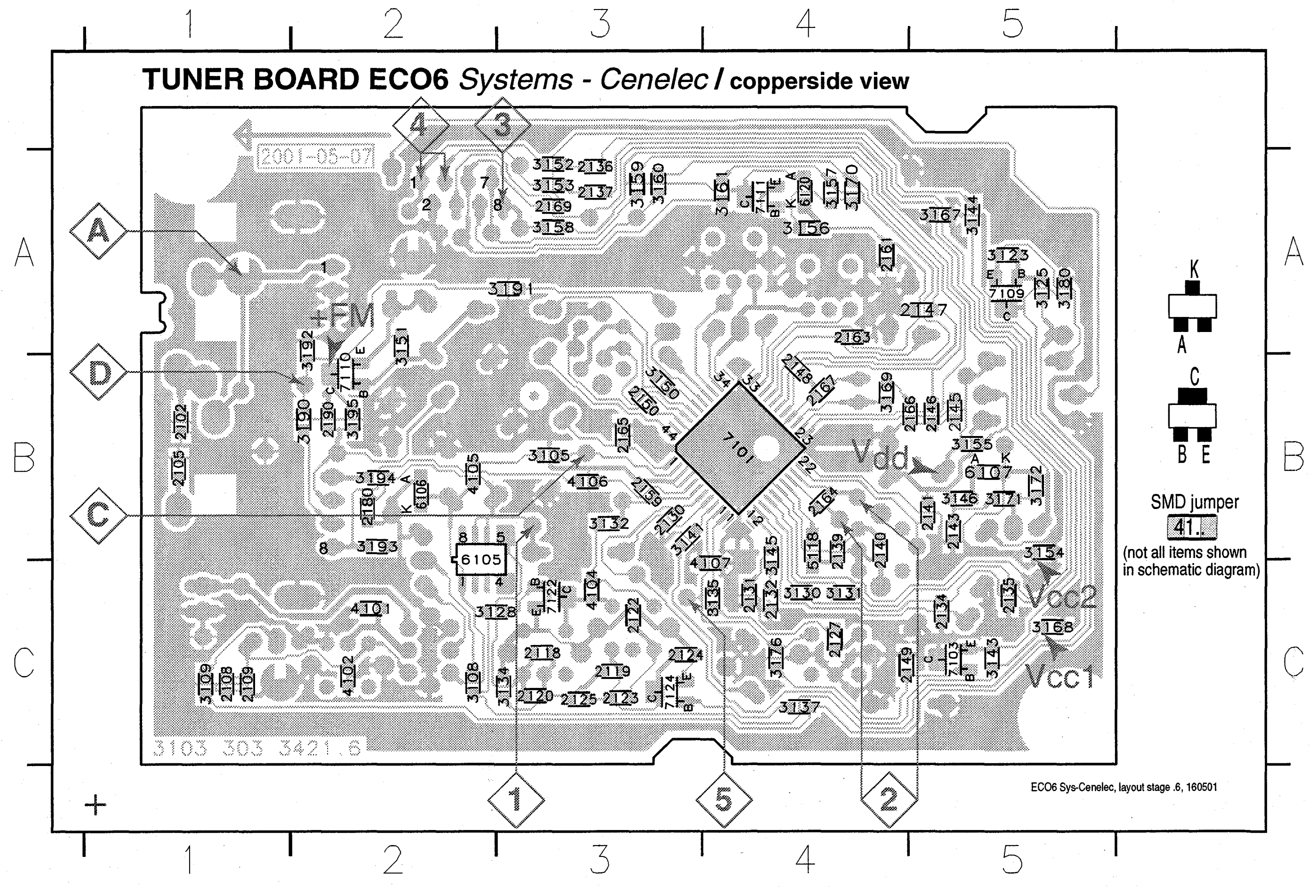
1101	B5	1110	B4	1131	C5	2107	B3	2133	C1	2162	A4	5102	C4	5110	A2	5114	A2	5121	B2	7104	C4	9101	A2	9104	B1	9107	B4	9110	A4
1102	B5	1120	A4	1132	A4	2128	A3	2138	B1	2191	B4	5103	C4	5111	A3	5115	C2	5122	C3	7105	C5	9102	B2	9105	B1	9108	B3	9111	A3
1103	C5	1130	A5	2106	B4	2129	B3	2144	B1	3142	C2	5109	B3	5112	A2	5119	B2	5123	C3	7112	B1	9103	A1	9106	B1	9109	C2		



TUNER BOARD ECO6 *Systems - Cenelec* / componentside view

1
2
3
4
5
A
B
C
STEREO
CLOCK
DATA
ENABLE
VCC
RIGHT
GND
LEFT
2001-05-07
1101
1110
1120
1132
1102
1130
AM-IF2
5112
AM-AFC
5114
AM-IF1
5111
9101
9103
9104
9106
9105
9102
5121
5110
FM-IF2
5109
FM-IF1
9111
2128
2162
2191
2129
AM-RF
2107
2106
9107
9110
FM FRONTEND
FM 75Ω
2144
7112
E B C
DISCR
5119
9108
7104
AM FRAME AERIAL
1103
2133
2138
5115
VCO
5122
LW-OSC
5123
MW-OSC
5102
MW-RF
5103
LW-RF
7105
1131
9109
Birdy Filter
3142
3103 303 3421.6
ECO6 Sys-Cenelec, layout stage .6, 160501

2102	B1	2120	C3	2130	B3	2137	A3	2146	B5	2161	A4	2169	A3	3123	A5	3134	C3	3145	C4	3154	B5	3160	A3	3171	B5	3192	A2	4104	C3	6106	B2	7110	B2
2105	B1	2122	C3	2131	C4	2139	B4	2147	A5	2163	A4	2180	B2	3125	A5	3135	C4	3146	B5	3155	B5	3161	A4	3172	B5	3193	B2	4105	B2	6107	B5	7111	A4
2108	C1	2123	C3	2132	C4	2140	B4	2148	B4	2164	B4	2190	B2	3128	C2	3137	C4	3150	B3	3156	A4	3167	A5	3176	C4	3194	B2	4106	B3	6120	A4	7122	C3
2109	C1	2124	C3	2134	C5	2141	B5	2149	C4	2165	B3	3105	B3	3130	C4	3141	B3	3151	A2	3157	A4	3168	C5	3180	A5	3195	B2	4107	C4	7101	B4	7124	C3
2118	C3	2125	C3	2135	C5	2143	B5	2150	B3	2166	B5	3108	C2	3131	C4	3143	C5	3152	A3	3158	A3	3169	B4	3190	B2	4101	C2	5118	C4	7103	C5		
2119	C3	2127	C4	2136	A3	2145	B5	2159	B3	2167	B4	3109	C1	3132	B3	3144	A5	3153	A3	3159	A3	3170	A4	3191	A3	4102	C2	6105	B2	7109	A5		

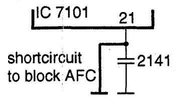
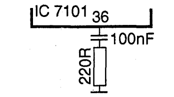
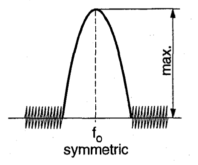
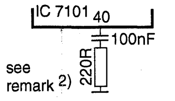
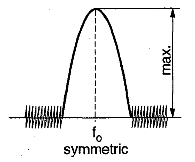


TUNER BOARD ECO6 *Systems - Cenelec* / copperside view

1
2
3
4
5
A
B
C
2001-05-07
4
3
A
D
C
+FM
7101
Vdd
Vcc2
Vcc1
3191
3105
3106
3132
3193
6105
4101
3128
4102
6107
1
2
5
K
A
C
B E
SMD jumper
41.
(not all items shown in schematic diagram)
3103 303 3421.6
ECO6 Sys-Cenelec, layout stage .6, 160501

These assembly drawings show a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

TUNER ADJUSTMENT TABLE (ECO6 Cenelec FM/MW - and FM/MW/LW - versions with AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (50kHz grid)			108MHz	check	◇ 1	8V ±1.2V
			87.5MHz	check		1.6V ±0.5V
MW 531 - 1602kHz (9kHz grid)			1602kHz	5123		8V ±0.2V 3-band 6.9V ±0.2V 2-band
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz (3kHz grid)			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
FM - IF						
FM	10.7MHz, 45mV continuous wave	◇ D	 IC 7101 21 shortcircuit to block AFC 2141	5119	◇ 2	0mV ±3mV
FM - VCO						
FM	98MHz, 1mV continuous wave	◇ A	98MHz	3142	◇ 3	152kHz ±1kHz [1]
FM RF (channel separation)	Note: The FM-frontend unit has already been adjusted by the factory and needs therefore no further adjustments for service purposes.					
FM	98MHz, 1mV 90% Left + 9% pilot mod=1kHz	◇ A	98MHz	IF coil inside FM frontend 1110	◇ 4	right channel min.
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with 3.3kΩ to Vcc	◇ C Δf = ±10kHz V_{RF} = 0.5mV (as low as possible)	 IC 7101 36 100nF 220R	5111	◇ 5	 max. f_o symmetric ↕
			 IC 7101 40 100nF 220R see remark [2]	5112		
AM AFC **MW**		◇ C continuous wave V_{RF} = 2mV		5114	◇ 2	0mV ±2mV
AM RF [3]						
MW	1494kHz	◇ B Δf = ±30kHz V_{RF} as low as possible	1494kHz	2106	◇ 5	 max. f_o symmetric ↕
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		

ECO6 Sys Cenelec, 190599

Use Service Testprogram. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

[1] If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

[2] RC network serves for damping the IF-filter while adjusting the other one.

[3] For AM RF adjustments the original frame antenna has to be used!
MW has to be aligned before LW.

↕ Repeat

Electrical Partslist *ECO6* *SYSTEMS-CENELEC*

MISCELLANEOUS

1101	2422 015 19376	SOCKET CLICKFIT 2P	USA only
1102	4822 267 10283	SOCKET COAX, IEC 75Ω	not USA
1103	4822 265 31184	JST CONNECTOR, 2 POLE	
1110	2422 542 90071	FM FRONTEND	
1120	4822 265 11515	FFC SOCKET, 8P	

CAPACITORS

2102©	4822 126 13838	100nF	10%	50V	not USA
2105©	4822 126 13838	100nF	10%	50V	USA only
2106	2020 800 00204	TRIMCAP. 4,2 - 20pF, N750			LW only
2106	2020 800 00191	TRIMCAP. 3 - 11pF, N450			FM/AM only
2107	4822 121 51319	1µF	20%	50V	
2108©	5322 122 32531	100pF	5%	50V	LW only
2109©	5322 122 32448	10pF	5%	50V	LW only
2120©	4822 126 13689	18pF	1%	63V	FM/AM only
2120©	5322 122 32658	22pF	5%	50V	LW only
2122©	4822 122 33891	3,3nF	10%	63V	LW only
2123©	2020 552 93494	390pF	1%	50V	LW only
2124©	4822 122 33177	10nF	20%	50V	FM/AM only
2125©	2020 552 96199	560pF	1%	50V	
2127©	4822 126 14076	220nF	20%	25V	
2128	4822 124 40248	10µF	20%	63V	
2129	4822 124 41584	100µF	20%	10V	
2130©	5322 122 32654	22nF	10%	63V	
2131©	4822 126 13482	470nF	20%	16V	
2132©	4822 126 13482	470nF	20%	16V	
2133	4822 124 21913	1µF	20%	63V	
2134©	3198 017 31530	15nF	10%	50V	not USA
2134©	5322 122 32654	22nF	10%	63V	USA only
2135©	3198 017 31530	15nF	10%	50V	not USA
2135©	3198 017 32230	22nF	10%	25V	USA only
2136©	4822 126 14076	220nF	20%	25V	
2137©	4822 126 14076	220nF	20%	25V	
2138	4822 124 22652	2,2µF	20%	50V	
2139©	4822 126 14236	15pF	5%	50V	
2140©	4822 126 13695	82pF	1%	63V	
2141©	4822 126 13838	100nF	10%	50V	
2143©	4822 126 14076	220nF	20%	25V	
2144	4822 124 21913	1µF	20%	63V	
2145©	4822 122 33575	220pF	5%	50V	
2146©	4822 122 33575	220pF	5%	50V	
2147©	4822 122 33575	220pF	5%	50V	
2148©	4822 122 33127	2,2nF	10%	63V	
2149©	5322 122 32659	33pF	5%	50V	RDS only
2150©	4822 126 13838	100nF	10%	50V	
2159©	5322 122 31151	22µF	20%	50V	
2163©	4822 126 13838	100nF	10%	50V	LW only
2164©	4822 126 13482	470nF	20%	16V	
2165©	4822 126 13838	100nF	10%	50V	
2166©	5322 122 31647	1nF	10%	63V	
2167©	4822 122 33926	12pF	5%	50V	
2169©	4822 122 33127	2,2nF	10%	63V	RDS only
2180©	3198 017 31030	10nF	10%	50V	
2190©	4822 126 13838	100nF	10%	50V	
2191	4822 124 40178	100µF	20%	10V	

RESISTORS

3105©	4822 117 11503	220Ω	5%	0,1W	
3108©	4822 117 11449	2,2kΩ	1%	0,1W	LW only
3109©	4822 051 20472	4,7kΩ	5%	0,1W	LW only
3123©	4822 051 20472	4,7kΩ	5%	0,1W	LW only
3125©	4822 117 10833	10kΩ	1%	0,1W	LW only
3128©	4822 117 11449	2,2kΩ	1%	0,1W	LW only
3130©	3198 021 38210	820Ω	5%	0,06W	
3131©	3198 021 38210	820Ω	5%	0,06W	
3132©	4822 051 20479	47Ω	5%	0,1W	
3134©	4822 051 20223	22kΩ	5%	0,1W	
3135©	3198 021 31020	1kΩ	5%	0,06W	
3137©	4822 051 20223	22kΩ	5%	0,1W	LW only
3141©	4822 117 11148	56kΩ	1%	0,1W	
3142	4822 100 12159	TRIMPOT. 100kΩ			
3143©	4822 051 20223	22kΩ	5%	0,1W	RDS only
3144©	4822 051 10102	1kΩ	2%	0,25W	RDS only
3145©	4822 117 11449	2,2kΩ	1%	0,1W	
3146©	4822 051 20229	22Ω	5%	0,1W	
3150©	4822 117 10833	10kΩ	1%	0,1W	
3151©	4822 051 20683	68kΩ	5%	0,1W	
3152©	4822 051 20471	470Ω	5%	0,1W	
3153©	4822 051 20471	470Ω	5%	0,1W	
3154©	4822 117 13577	330Ω	1%	0,1W	
3155©	4822 117 10353	150Ω	5%	0,1W	
3156©	4822 117 10837	100kΩ	1%	0,1W	
3157©	4822 117 10837	100kΩ	1%	0,1W	
3158©	4822 051 20471	470Ω	5%	0,1W	
3159©	4822 051 20471	470Ω	5%	0,1W	
3160©	4822 051 20471	470Ω	5%	0,1W	
3161©	4822 051 20223	22kΩ	5%	0,1W	
3167©	4822 051 20121	120Ω	5%	0,1W	
3168©	4822 051 20121	120Ω	5%	0,1W	
3169©	4822 051 20154	150kΩ	5%	0,1W	
3170©	4822 117 10837	100kΩ	1%	0,1W	
3171©	4822 117 10834	47kΩ	1%	0,1W	
3172©	4822 051 20562	5,6kΩ	5%	0,1W	
3176©	4822 051 20333	33kΩ	5%	0,1W	RDS only
3180©	4822 117 10833	10kΩ	1%	0,1W	LW only
3190©	4822 051 20121	120Ω	5%	0,1W	
3191©	4822 051 20121	120Ω	5%	0,1W	
3192©	4822 117 13577	330Ω	1%	0,1W	
3193©	4822 117 13577	330Ω	1%	0,1W	
3194©	4822 117 11449	2,2kΩ	1%	0,1W	
3195©	4822 051 20101	100Ω	5%	0,1W	
4101©	4822 051 20008	CHIP JUMPER 0805			FM/AM only
4102©	4822 051 20008	CHIP JUMPER 0805			FM/AM only
4104©	4822 051 20008	CHIP JUMPER 0805			FM/AM only
4105©	4822 051 20008	CHIP JUMPER 0805			
4106©	4822 051 20008	CHIP JUMPER 0805			
4107©	4822 051 20008	CHIP JUMPER 0805			

COILS

5102	4822 157 71634	RF-COIL MW	
5103	2422 549 44107	RF-COIL LW	LW only
5109	4822 157 71639	FM-IF FILTER 10,7MHz	
5110	4822 242 70665	FM-IF FILTER 10,7MHz	
5111	2422 549 44023	AM-IF FILTER 450kHz	
5112	4822 157 70302	AM-IF FILTER 450kHz	
5114	4822 157 70302	AM-IF FILTER 450kHz	
5115	4822 157 71636	ANTI BIRDY FILTER	
5118©	2422 535 95881	100nH	
5119	4822 157 11443	DISCRIMINATOR COIL	
5121	4822 242 10261	QUARTZ 75kHz	
5122	2422 549 44108	RF-COIL, LW-OSCILLATOR	LW only
5123	2422 549 44108	RF-COIL, MW-OSCILLATOR	

DIODES

6105©	4822 130 83075	HN1V02H
6106©	4822 130 83757	BAS216
6107©	9340 386 90115	BZX284-C11
6120©	4822 130 83757	BAS216

TRANSISTORS

7103©	5322 130 42756	BC857C	RDS only
7104	9322 003 64676	TBC337-40	LW only
7105	9322 003 64676	TBC337-40	LW only
7109©	4822 130 60373	BC856B	LW only
7110©	4822 130 60373	BC856B	
7111©	5322 130 42755	BC847C	
7112	4822 130 44503	BC547C	
7122©	5322 130 42755	BC847C	LW only
7124©	5322 130 42755	BC847C	LW only

INTEGRATED CIRCUITS

7101	4822 209 90315	TEA5762H/V1, RADIO IC

PWR303
MODULE UCD 100-150W

Mains pt5 / Reg pt3 / Amp pt2 / Spk pt5 - 17 Nov 03

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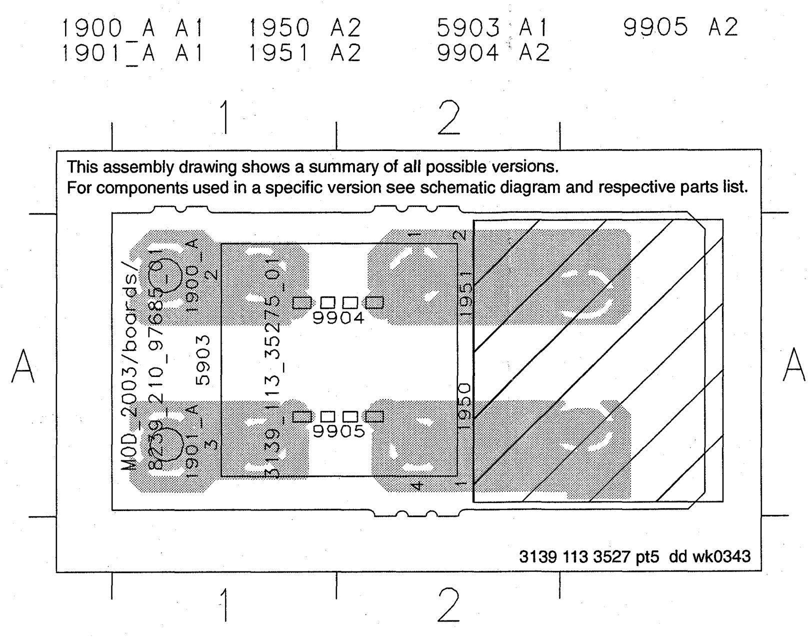
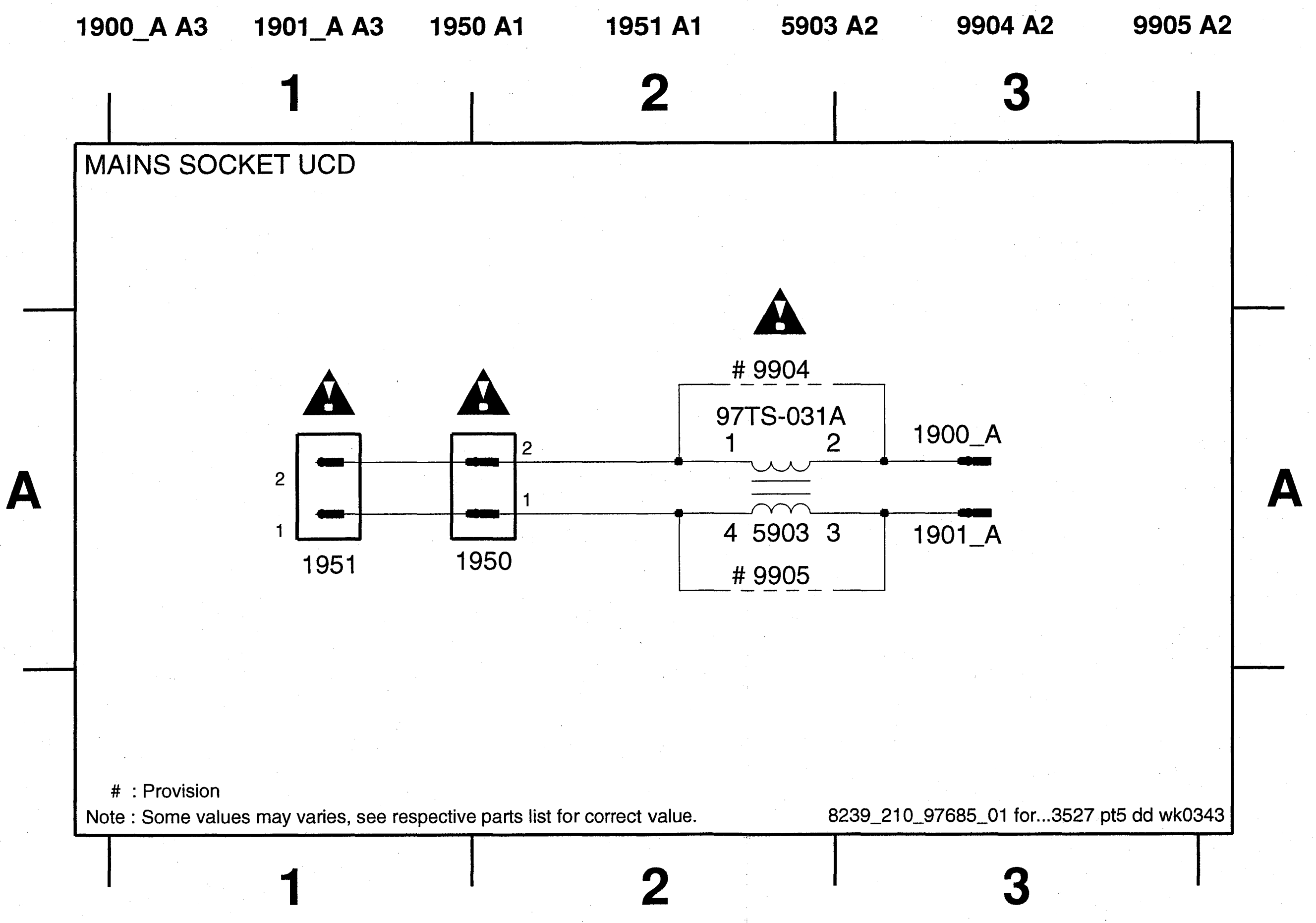
MAINS SOCKET UCD BOARD - COMPONENT LAYOUT


1900_A A1
1901_A A1
1950 A2
1951 A2
5903 A1
9904 A2
9905 A2
1
2
A
A
MOD_2003/boards/
8239_210_97685_01
3139_113_35275_01
1900_A
1901_A
5903
9904
9905
1950
1951
3139 113 3527 pt5 dd wk0343

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram and respective parts list.

MAINS SOCKET UCD BOARD - CIRCUIT DIAGRAM

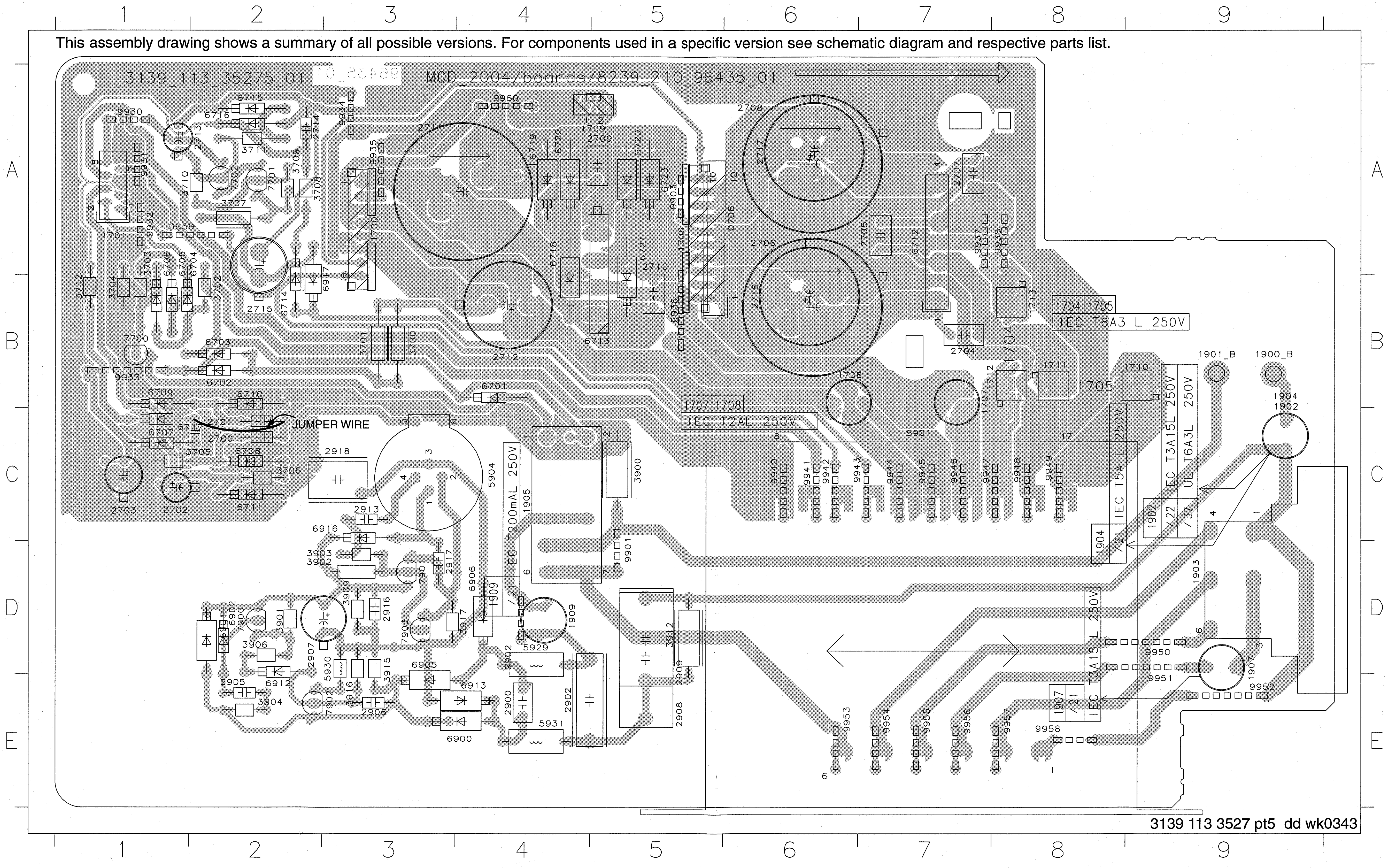

1900_A A3
1901_A A3
1950 A1
1951 A1
5903 A2
9904 A2
9905 A2
1
2
3
A
A
MAINS SOCKET UCD
# 9904
97TS-031A
1
2
4 5903 3
# 9905
1900_A
1901_A
1951
1950
8239_210_97685_01 for...3527 pt5 dd wk0343

: Provision
Note : Some values may varies, see respective parts list for correct value.

MAINS UCD BOARD - COMPONENT LAYOUT

0706	A6
1700	A3
1701	A1
1706	A5
1707	B7
1708	B6
1709	A5
1710	B9
1711	B8
1712	B7
1713	B8
1900_B	B9
1901_B	B9
1902	B9
1903	D9
1904	B9
1905	C4
1907	D9
1909	D4
2700	C2
2701	C2
2702	C1
2703	C1
2704	B7
2705	A7
2706	A6
2707	A7
2708	A6
2709	A5
2710	A5
2711	A3
2712	B4
2713	A2
2714	A2
2715	B2
2716	B6
2717	A6
2900	E4
2902	E4
2905	E2
2906	E3
2907	D2
2908	E5
2909	D5
2913	C3
2916	D3
2917	D3
2918	C3
3700	B3
3701	B3
3702	B2
3703	A1
3704	B1
3705	C2
3706	C2
3707	A2
3708	A2
3709	A2
3710	A1
3711	A2
3712	B1
3900	C5
3901	D2
3902	D2
3903	D2
3904	E2
3906	D2
3909	D3
3912	D5
3915	D3
3916	E3
3917	D4
5901	C7
5904	C4
5929	D4
5930	D3
5931	E4
6701	B4
6702	B2
6703	B2
6704	A2
6705	A1
6706	A1
6707	C1
6708	C2
6709	B1
6710	B2
6711	C2
6712	A7
6713	B5
6714	B2
6715	A2
6716	A2
6717	C2
6718	A4
6719	A4
6720	A5
6721	A5
6722	A4
6723	A5
6900	E4
6901	D2
6902	D2
6905	D3
6906	D4
6912	E2
6913	E4
6916	C3
6917	B3
7700	B1
7701	A2
7702	A2
7900	D2
7901	D3
7902	E3
7903	D3
9901	D5
9902	D4
9903	A5
9930	A1
9931	A1
9932	A1
9933	B1
9934	A3
9935	A3
9936	B5
9937	A7
9938	A8
9940	C6
9941	C6
9942	C6
9943	C6
9944	C7
9945	C7
9946	C7
9947	C7
9948	C8
9949	C8
9950	D9
9951	E9
9952	E9
9953	E6
9954	E7
9955	E7
9956	E7
9957	E8
9958	E8
9959	A1
9960	A4

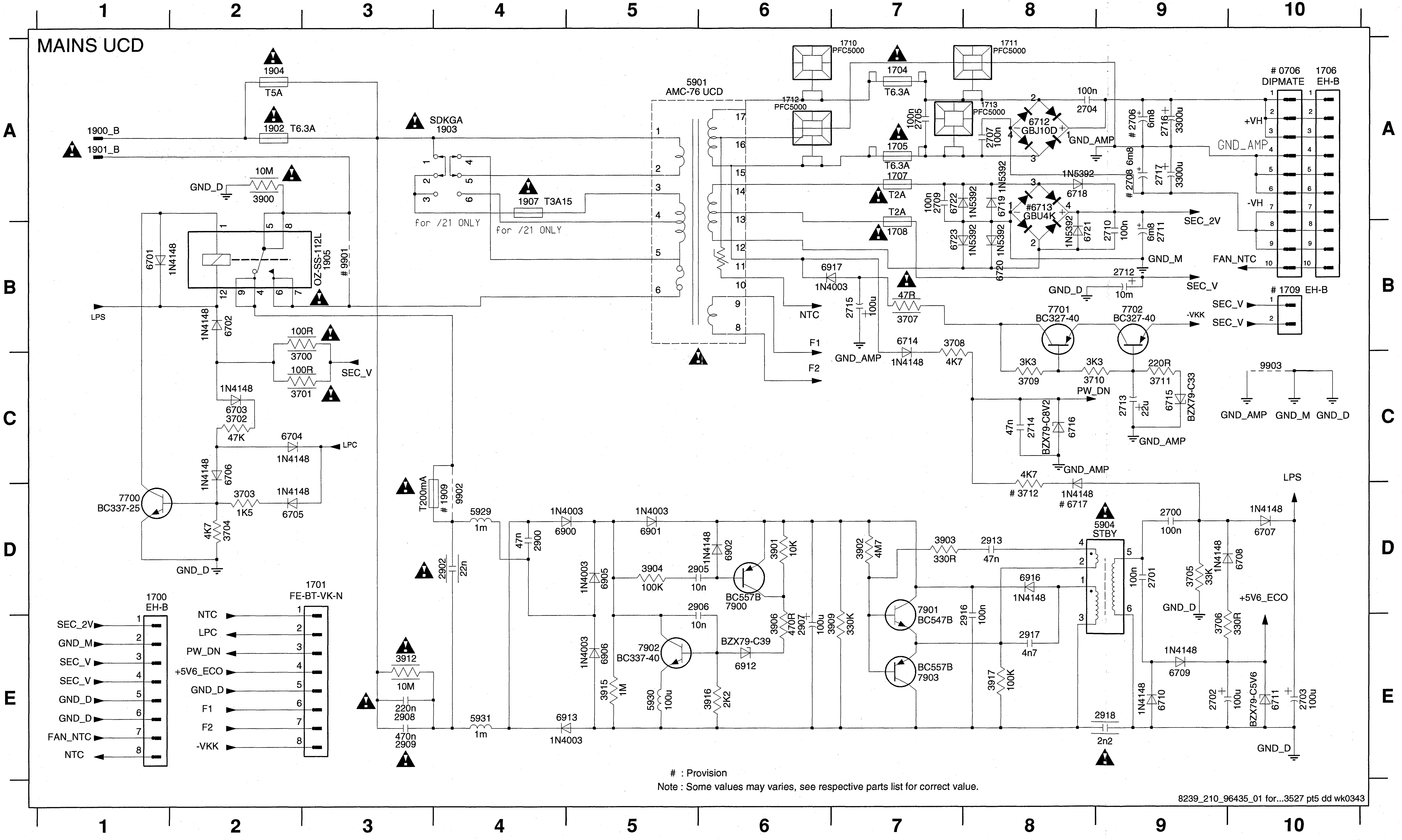
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.


1
2
3
4
5
6
7
8
9
A
B
C
D
E
3139_113_35275_01
MOD_2004/boards/8239_210_96435_01
1704 1705
IEC T6A3 L 250V
1707 1708
IEC T2AL 250V
IEC T200mAL 250V
1905
1909 /21
IEC T5A L 250V
1904 /21
IEC T3A15L 250V
UL T6A3L 250V
1902 /22 /37
IEC T3A15 L 250V
1907 /21
1901_B
1900_B
1904
1902
1903
1907
JUMPER WIRE
2711
2712
2708
2717
2706
2716
2715
2703
2702
2918
2907
5901
5904
5929
5931
3900
3912
2909
2908
2902
2900
1700
1701
1706
1708
1709
1710
1711
1712
1713
0706
7700
9930
9933
9950
9951
9952
9958

3139 113 3527 pt5 dd wk0343

MAINS UCD BOARD - CIRCUIT DIAGRAM

0706	A10
1700	D1
1701	D3
1704	A7
1705	A7
1706	A10
1707	A7
1708	B7
1709	B10
1710	A7
1711	A8
1712	A6
1713	A7
1900_B	A1
1901_B	A1
1902	A2
1903	A4
1904	A2
1905	B3
1907	A4
1909	D4
2700	D9
2701	D9
2702	E9
2703	E10
2704	A8
2705	A7
2706	A9
2707	A8
2708	A9
2709	A7
2710	B9
2711	B9
2712	B9
2713	C9
2714	C8
2715	B7
2716	A9
2717	A9
2900	D4
2902	D4
2905	D5
2906	D5
2907	E6
2908	E3
2909	E3
2913	D8
2916	E8
2917	E8
2918	E9
3700	C2
3701	C2
3702	C2
3703	D2
3704	D2
3705	D9
3706	E9
3707	B7
3708	B7
3709	C8
3710	C8
3711	C9
3712	D8
3900	A2
3901	D6
3902	D7
3903	D7
3904	D5
3906	E6
3909	E7
3912	E3
3915	E5
3916	E6
3917	E8
5901	A6
5904	D8
5929	D4
5930	E5
5931	E4
6701	B1
6702	B2
6703	C2
6704	C2
6705	D2
6706	C2
6707	D10
6708	D10
6709	E9
6710	E9
6711	E10
6712	A8
6713	A8
6714	B7
6715	C9
6716	C8
6717	D8
6718	A8
6719	A8
6720	B8
6721	B8
6722	A8
6723	B7
6900	D4
6901	D5
6902	D6
6905	D5
6906	E5
6912	E6
6913	E5
6916	D8
6917	B7
7700	D1
7701	B8
7702	B9
7900	D6
7901	D7
7902	E5
7903	E7
9901	B3
9902	D4
9903	C10


MAINS UCD
1 2 3 4 5 6 7 8 9 10
A B C D E
1900_B
1901_B
1904 T5A
1902 T6.3A
10M 3900
GND_D
OZ-SS-112L 1905
# 9901
6701 1N4148
LPS
1N4148 6702
100R 3700
100R 3701
SEC_V
1N4148 6703
3702 47K
6704 1N4148
LPC
1N4148 6706
3703 1K5
1N4148 6705
7700 BC337-25
4K7 3704
SDKGA 1903
for /21 ONLY
1907 T3A15
5901 AMC-76 UCD
1710 PFC5000
1711 PFC5000
1712 PFC5000
1713 PFC5000
1704 T6.3A
1705 T6.3A
1707 T2A
1708 T2A
6712 GBJ10D
#6713 GBU4K
100n 2704
# 2706 6m8
2716 3300u
# 2708 6m8
2717 3300u
GND_AMP
1N5392 6718
SEC_2V
GND_M
# 0706 DIPMATE
1706 EH-B
+VH
-VH
FAN_NTC
2712 10m
SEC_V
6917 1N4003
2715 100u
47R 3707
NTC
F1
F2
6714 1N4148
3708 4K7
7701 BC327-40
7702 BC327-40
-VKK
# 1709 EH-B
3K3 3709
3K3 3710
220R 3711
PW_DN
2713 22u
6715 BZX79-C33
47n 2714
BZX79-C8V2 6716
9903
GND_AMP GND_M GND_D
4K7 # 3712
1N4148 # 6717
T200mA # 1909
9902
5929 1m
2902 22n
47n 2900
1N4003 6900
1N4003 6901
1N4148 6902
3901 10K
1N4003 6905
3904 100K
2905 10n
BC557B 7900
2906 10n
7902 BC337-40
BZX79-C39 6912
3906 470R
2907 100u
3909 330K
1N4003 6906
3915 1M
5930 100u
3916 2K2
3902 4M7
3903 330R
2913 47n
7901 BC547B
BC557B 7903
2916 100n
6916 1N4148
2917 4n7
3917 100K
5904 STBY
2918 2n2
2700 100n
2701 100n
3705 33K
1N4148 6707
1N4148 6708
+5V6_ECO
3706 330R
1N4148 6709
1N4148 6710
2702 100u
BZX79-C5V6 6711
2703 100u
LPS
3912 10M
220n 2908
470n 2909
5931 1m
6913 1N4003
1700 EH-B
SEC_2V
GND_M
SEC_V
SEC_V
GND_D
GND_D
FAN_NTC
NTC
1701 FE-BT-VK-N
NTC
LPC
PW_DN
+5V6_ECO
GND_D
F1
F2
-VKK

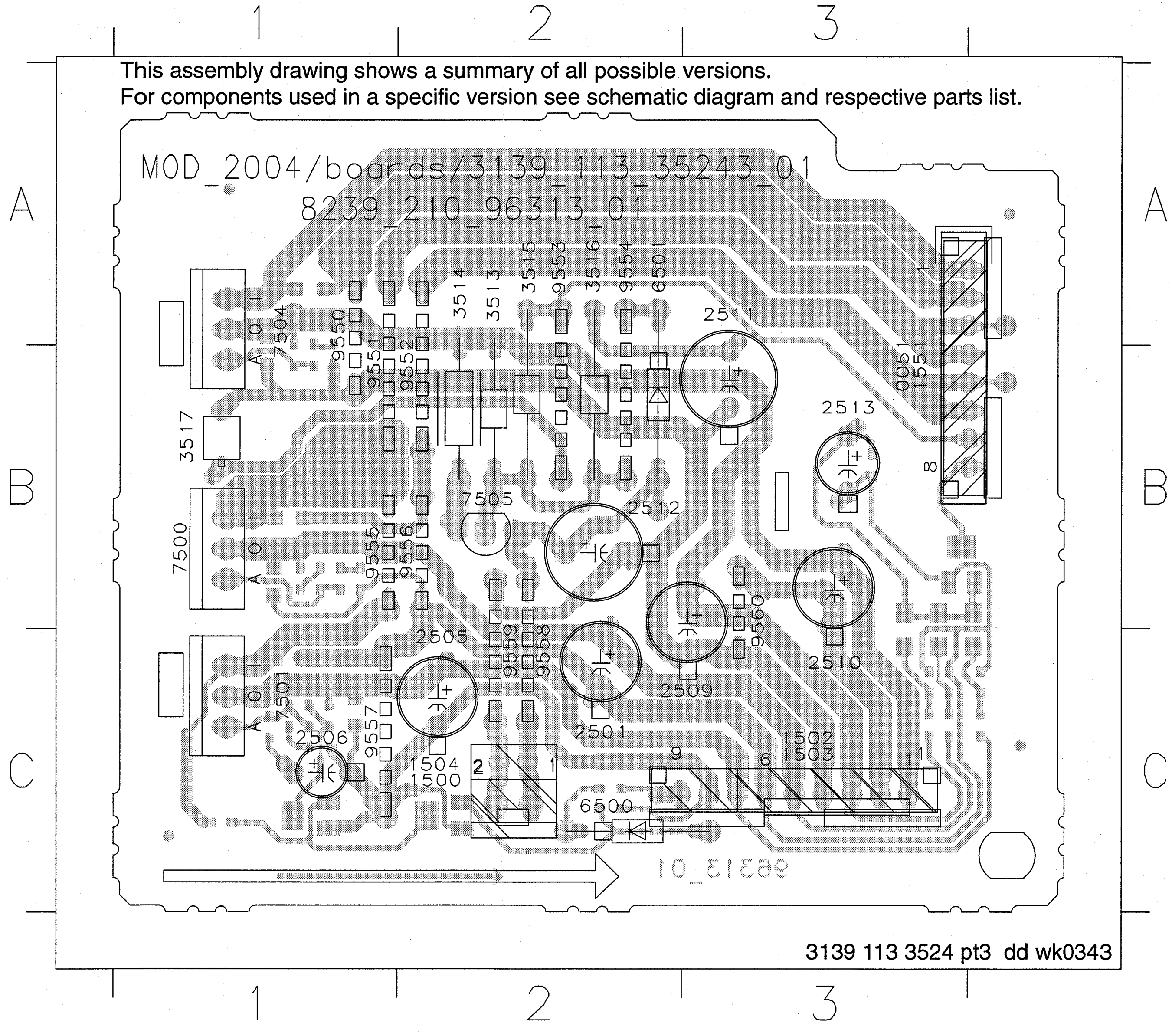
: Provision

Note : Some values may varies, see respective parts list for correct value.

8239_210_96435_01 for...3527 pt5 dd wk0343

REGULATOR UCD BOARD - COMPONENT LAYOUT

0051	B3	2501	C2	2512	B2	3517	B1	7505	B2	9555	B1
1500	C2	2505	C2	2513	B3	6500	C2	9550	A1	9556	B2
1502	C3	2506	C1	3513	A2	6501	A2	9551	B1	9557	C1
1503	C3	2509	C3	3514	A2	7500	B1	9552	B2	9558	C2
1504	C2	2510	C3	3515	A2	7501	C1	9553	A2	9559	C2
1551	B3	2511	A3	3516	A2	7504	A1	9554	A2	9560	B3



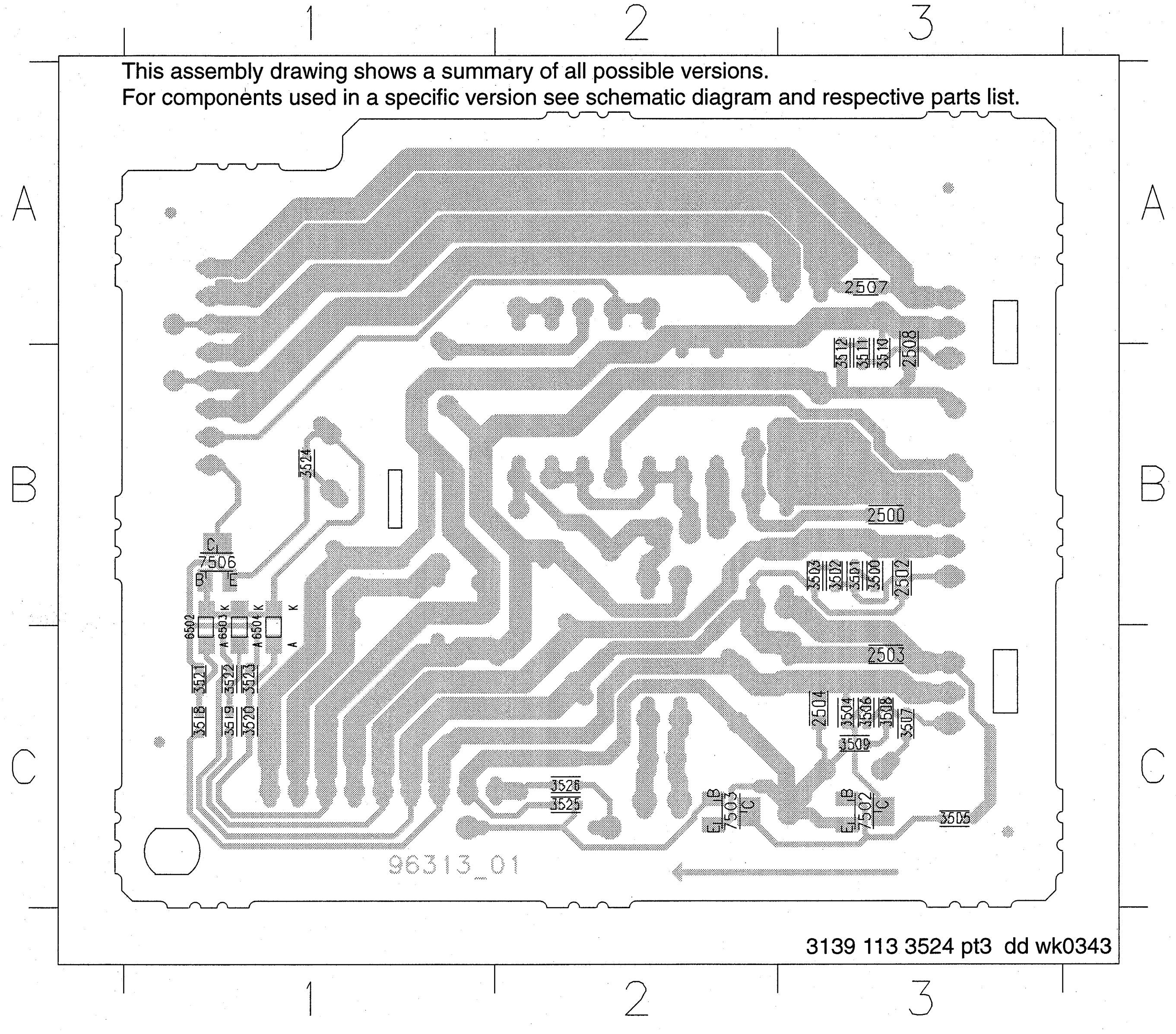
This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram and respective parts list.

1
2
3
A
B
C
MOD_2004/boards/3139_113_35243_01
8239_210_96313_01
7504
9550
9551
9552
3514
3513
3515
9553
3516
9554
6501
2511
0051
1551
2513
3517
7500
7505
2512
9555
9556
2505
9559
9558
9560
2510
2509
2501
7501
2506
9557
1504
1500
6500
1502
1503
96313_01

3139 113 3524 pt3 dd wk0343

REGULATOR UCD BOARD - CHIP LAYOUT

2500	B3	2508	B3	3504	C3	3509	C3	3519	C1	3524	B1	6504	C1
2502	B3	3500	B3	3505	C3	3510	B3	3520	C1	3525	C2	7502	C3
2503	C3	3501	B3	3506	C3	3511	B3	3521	C1	3526	C2	7503	C2
2504	C3	3502	B3	3507	C3	3512	B3	3522	C1	6502	C1	7506	B1
2507	A3	3503	B3	3508	C3	3518	C1	3523	C1	6503	C1		



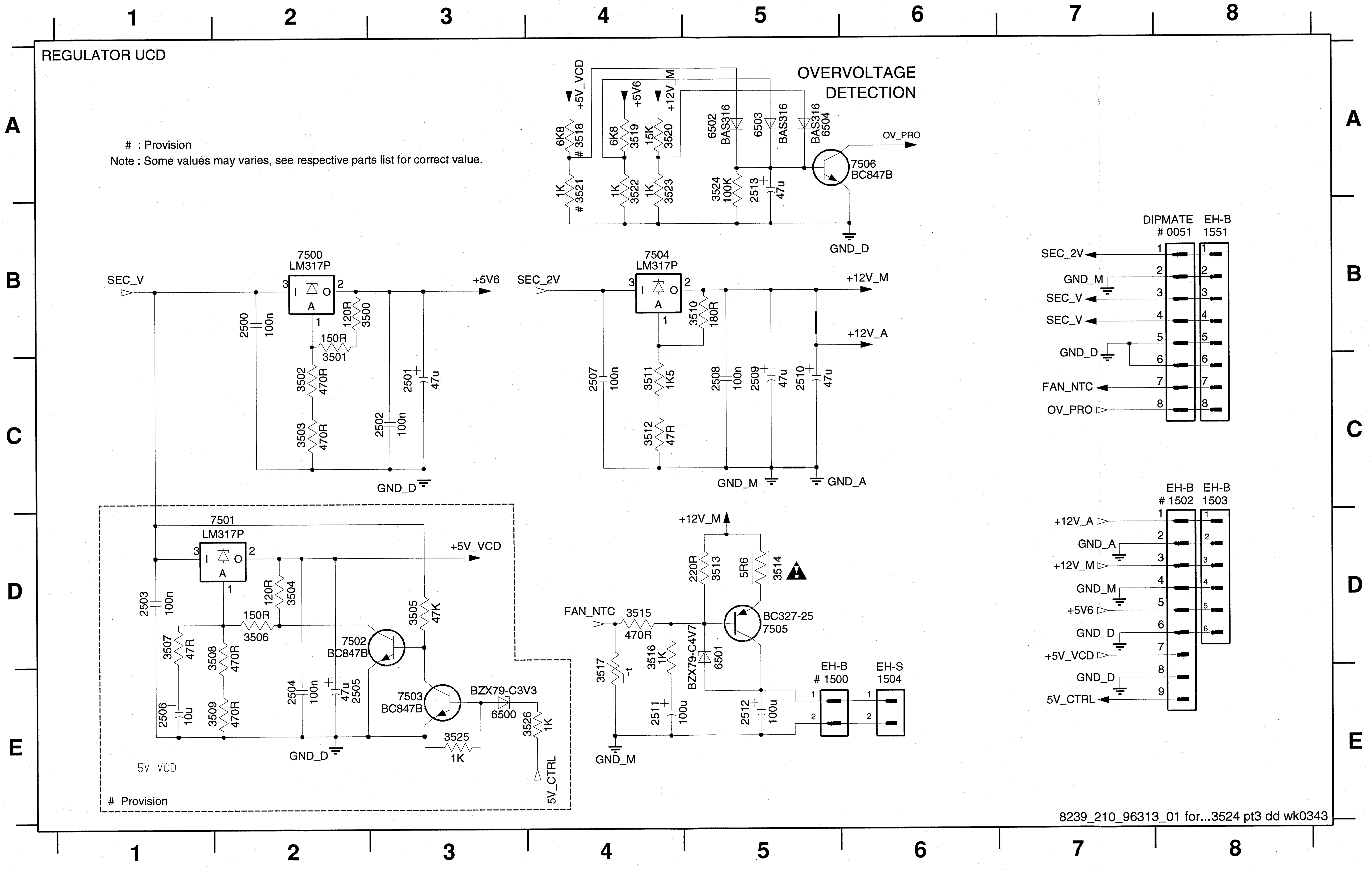
This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram and respective parts list.

1
2
3
A
B
C
2507
3512
3511
3510
2508
3524
2500
3503
3502
3501
3500
2502
7506
6502
6503
6504
3521
3522
3523
3518
3519
3520
2503
2504
3504
3506
3508
3507
3509
3526
3525
7503
7502
3505
96313_01

3139 113 3524 pt3 dd wk0343

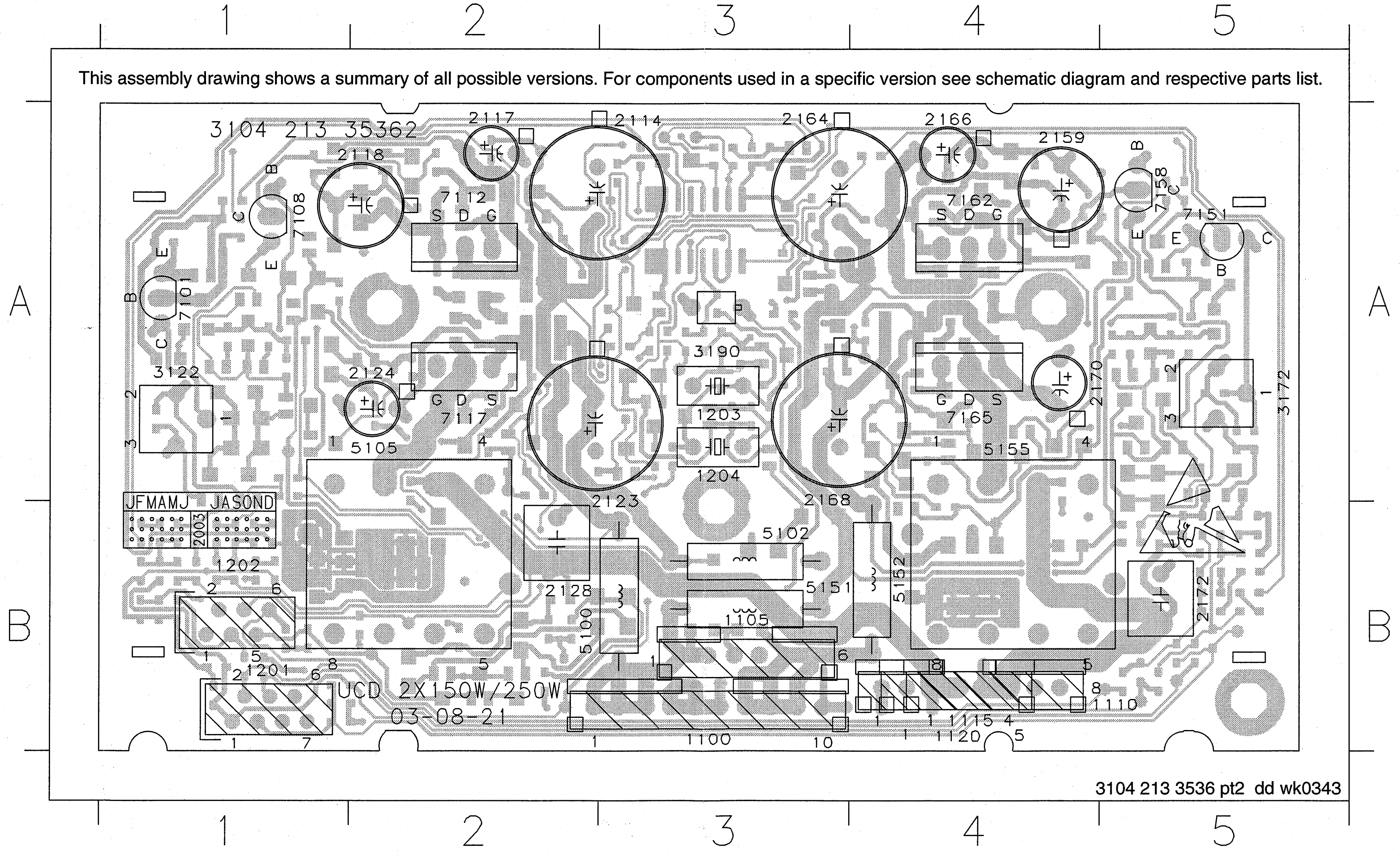
REGULATOR UCD BOARD - CIRCUIT DIAGRAM

0051	B8
1500	E5
1502	C8
1503	C8
1504	E6
1551	B8
2500	B2
2501	C3
2502	C3
2503	D1
2504	E2
2505	E2
2506	E1
2507	C4
2508	C5
2509	C5
2510	C5
2511	E4
2512	E5
2513	A5
3500	B2
3501	B2
3502	C2
3503	C2
3504	D2
3505	D3
3506	D2
3507	D1
3508	D2
3509	E2
3510	B5
3511	C4
3512	C4
3513	D5
3514	D5
3515	D4
3516	D4
3517	E4
3518	A4
3519	A4
3520	A4
3521	A4
3522	A4
3523	A4
3524	A5
3525	E3
3526	E4
6500	E3
6501	D5
6502	A5
6503	A5
6504	A5
7500	B2
7501	D1
7502	D2
7503	E3
7504	B4
7505	D5
7506	A6


1 2 3 4 5 6 7 8
A B C D E
REGULATOR UCD
# : Provision
Note : Some values may varies, see respective parts list for correct value.
OVERVOLTAGE DETECTION
+5V_VCD
+5V6
+12V_M
6K8 # 3518
6K8 3519
15K 3520
1K # 3521
1K 3522
1K 3523
6502 BAS316
6503 BAS316
BAS316 6504
3524 100K
2513 47u
7506 BC847B
OV_PRO
GND_D
SEC_V
7500 LM317P
I O A
2500 100n
120R 3500
150R 3501
3502 470R
3503 470R
2501 47u
2502 100n
+5V6
GND_D
SEC_2V
7504 LM317P
3510 180R
2507 100n
3511 1K5
3512 47R
2508 100n
2509 47u
2510 47u
+12V_M
+12V_A
GND_M
GND_A
7501 LM317P
+5V_VCD
2503 100n
120R 3504
150R 3506
3505 47K
3507 47R
3508 470R
3509 470R
2506 10u
2504 100n
47u 2505
7502 BC847B
7503 BC847B
BZX79-C3V3
6500
3526 1K
3525 1K
GND_D
5V_VCD
5V_CTRL
# Provision
+12V_M
220R 3513
5R6 3514
FAN_NTC
3515 470R
3516 1K
3517
BZX79-C4V7 6501
BC327-25 7505
2511 100u
2512 100u
GND_M
EH-B # 1500
EH-S 1504
DIPMATE # 0051
EH-B 1551
SEC_2V
GND_M
SEC_V
SEC_V
GND_D
FAN_NTC
OV_PRO
EH-B # 1502
EH-B 1503
+12V_A
GND_A
+12V_M
GND_M
+5V6
GND_D
+5V_VCD
GND_D
5V_CTRL
8239_210_96313_01 for...3524 pt3 dd wk0343

AMPLIFIER UCD BOARD (SE) - COMPONENT LAYOUT

1100	B3	1201	B1	2117	A2	2159	A4	2172	B5	5102	B3	7101	A1	7158	A5
1105	B3	1202	B1	2118	A2	2164	A3	3122	A1	5105	B2	7108	A1	7162	A4
1110	B4	1203	A3	2123	A2	2166	A4	3172	A5	5151	B3	7112	A2	7165	A4
1115	B4	1204	A3	2124	A2	2168	A3	3190	A3	5152	B4	7117	A2		
1120	B4	2114	A2	2128	B2	2170	A4	5100	B3	5155	B4	7151	A5		



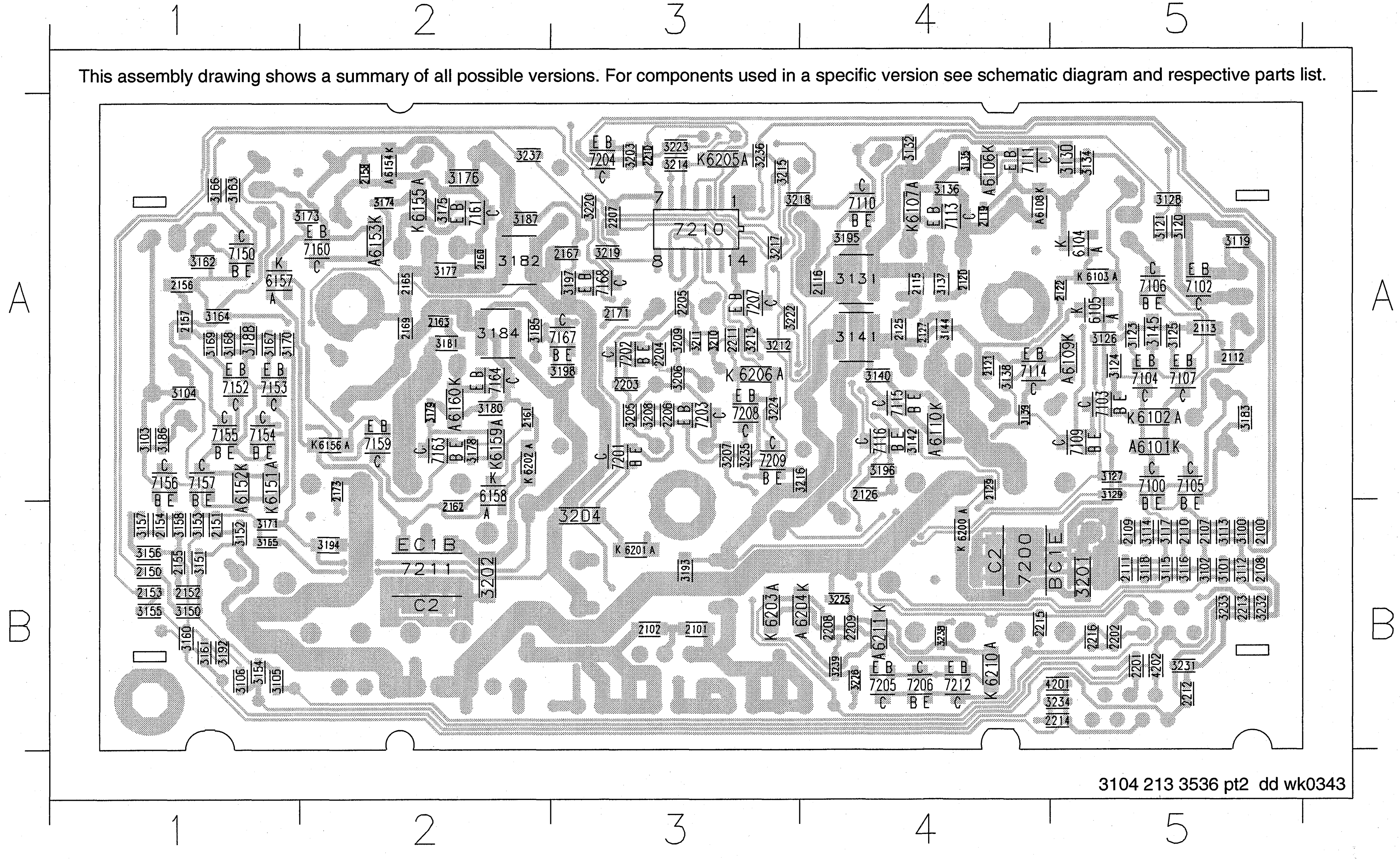
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

1
2
3
4
5
A
B
3104 213 35362
2117
2114
2164
2166
2159
2118
7112
S D G
7108
7162
7158
7151
7101
3122
2124
7117
G D S
5105
3190
1203
1204
2170
7165
5155
3172
2123
2168
5102
2128
5100
5151
1105
5152
2172
JFMAMJ
JASOND
2003
1202
1201
UCD 2X150W/250W
03-08-21
1100
1115
1120
1110

3104 213 3536 pt2 dd wk0343

AMPLIFIER UCD BOARD (SE) - CHIP LAYOUT

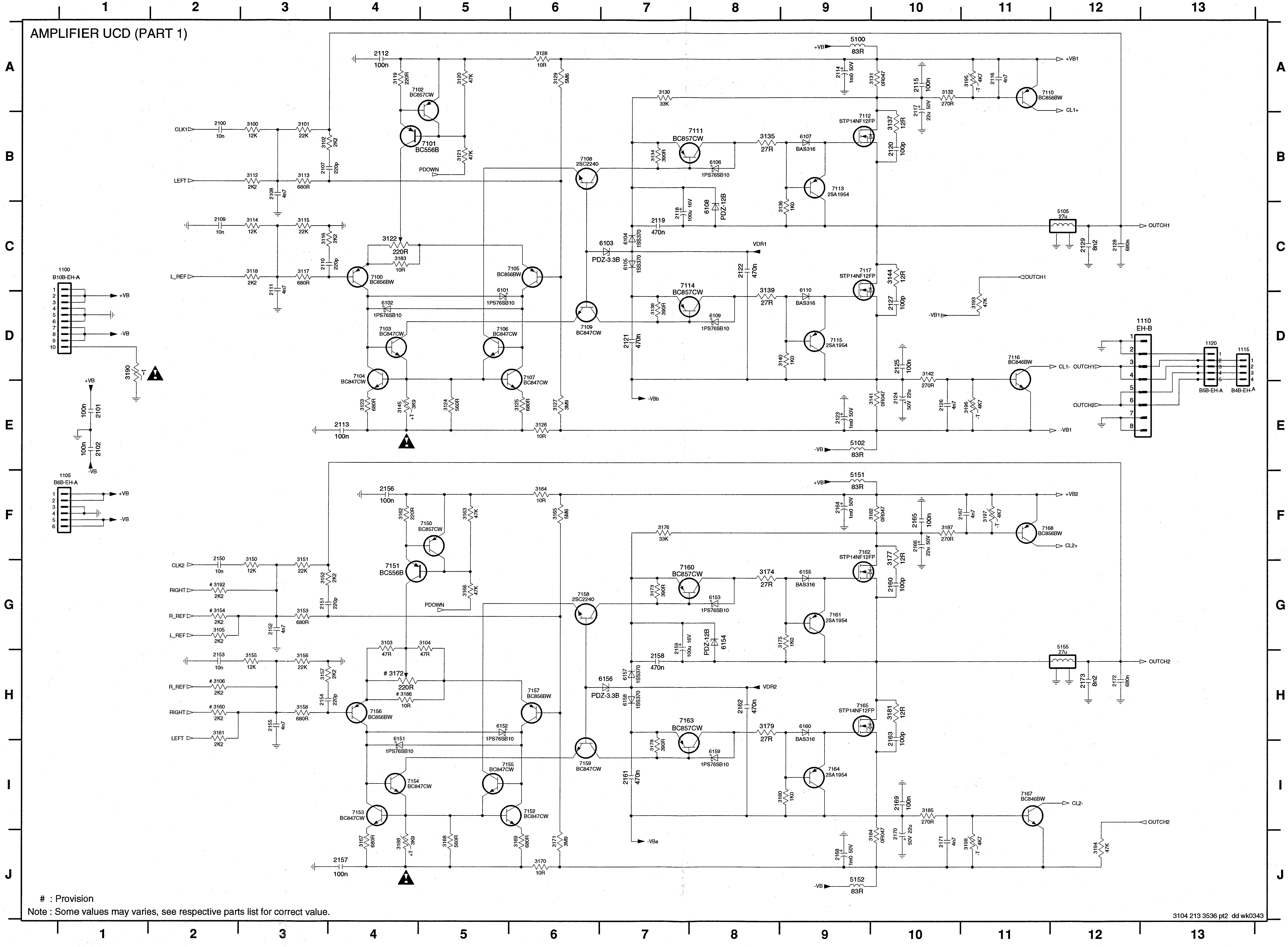
2100	B5
2101	B3
2102	B3
2107	B5
2108	B5
2109	B5
2110	B5
2111	B5
2112	A5
2113	A5
2115	A4
2116	A4
2119	A4
2120	A4
2121	A4
2122	A5
2125	A4
2126	A4
2127	A4
2129	A4
2150	B1
2151	B1
2152	B1
2153	B1
2154	B1
2155	B1
2156	A1
2157	A1
2158	A2
2160	A2
2161	A2
2162	B2
2163	A2
2165	A2
2167	A3
2169	A2
2171	A3
2173	A2
2201	B5
2202	B5
2203	A3
2204	A3
2205	A3
2206	A3
2207	A3
2208	B4
2209	B4
2210	A3
2211	A3
2212	B5
2213	B5
2214	B5
2215	B4
2216	B5
3100	B5
3101	B5
3102	B5
3103	A1
3104	A1
3105	B1
3106	B1
3112	B5
3113	B5
3114	B5
3115	B5
3116	B5
3117	B5
3118	B5
3119	A5
3120	A5
3121	A5
3123	A5
3124	A5
3125	A5
3126	A5
3127	A5
3128	A5
3129	A5
3130	A5
3131	A4
3132	A4
3134	A5
3135	A4
3136	A4
3137	A4
3138	A4
3139	A4
3140	A4
3141	A4
3142	A4
3144	A4
3145	A5
3150	B1
3151	B1
3152	B1
3153	B1
3154	B1
3155	B1
3156	B1
3157	B1
3158	B1
3160	B1
3161	B1
3162	A1
3163	A1
3164	A1
3165	B1
3166	A1
3167	A1
3168	A1
3169	A1
3170	A1
3171	B1
3173	A2
3174	A2
3175	A2
3176	A2
3177	A2
3178	A2
3179	A2
3180	A2
3181	A2
3182	A2
3183	A5
3184	A2
3185	A2
3186	A1
3187	A2
3188	A1
3192	B1
3193	B3
3194	B2
3195	A4
3196	A4
3197	A3
3198	A3
3201	B5
3202	B2
3203	A3
3204	B3
3205	A3
3206	A3
3207	A3
3208	A3
3209	A3
3210	A3
3211	A3
3212	A3
3213	A3
3214	A3
3215	A3
3216	A4
3217	A3
3218	A3
3219	A3
3220	A3
3222	A3
3223	A3
3224	A3
3225	B4
3226	B4
3231	B5
3232	B5
3233	B5
3234	B5
3235	A3
3236	A3
3237	A2
3238	B4
3239	B4
4201	B5
4202	B5
6101	A5
6102	A5
6103	A5
6104	A5
6105	A5
6106	A4
6107	A4
6108	A4
6109	A5
6110	A4
6151	A1
6152	A1
6153	A2
6154	A2
6155	A2
6156	A2
6157	A1
6158	A2
6159	A2
6160	A2
6200	B4
6201	B3
6202	A2
6203	B3
6204	B4
6205	A3
6206	A3
6210	B4
6211	B4
7100	A5
7102	A5
7103	A5
7104	A5
7105	A5
7106	A5
7107	A5
7109	A5
7110	A4
7111	A4
7113	A4
7114	A4
7115	A4
7116	A4
7150	A1
7152	A1
7153	A1
7154	A1
7155	A1
7156	A1
7157	A1
7159	A2
7160	A2
7161	A2
7163	A2
7164	A2
7167	A3
7168	A3
7200	B4
7201	A3
7202	A3
7203	A3
7204	A3
7205	B4
7206	B4
7207	A3
7208	A3
7209	A3
7210	A3
7211	B2
7212	B4
F100	B3
F101	B3
F102	B3
F103	B2
F104	B2
F105	B2
F106	B3
F107	A4
F108	A4
F109	A2
F110	A3
F111	A5
F112	B2
F113	A3
F114	B1
F115	B1
F116	B1
F117	B1
F118	B4
F119	B4
F120	B4
F121	A3
F122	A3



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

3104 213 3536 pt2 dd wk0343

AMPLIFIER UCD BOARD (SE) - CIRCUIT DIAGRAM PART 1


1 2 3 4 5 6 7 8 9 10 11 12 13
A B C D E F G H I J
AMPLIFIER UCD (PART 1)
CLK1
LEFT
L_REF
CLK2
RIGHT
R_REF
PDOWN
1100 B10B-EH-A
1105 B6B-EH-A
+VB
-VB
+VB1
-VB1
+VB2
-VBa
-VBb
VDR1
VDR2
CL1+
CL1-
CL2+
CL2-
OUTCH1
OUTCH2
1110 EH-B
1120 B5B-EH-A
1115 B4B-EH-A
7100 BC856BW
7101 BC556B
7102 BC857CW
7103 BC847CW
7104 BC847CW
7105 BC856BW
7106 BC847CW
7107 BC847CW
7108 2SC2240
7109 BC847CW
7110 BC856BW
7111 BC857CW
7112 STP14NF12FP
7113 2SA1954
7114 BC857CW
7115 2SA1954
7116 BC846BW
7117 STP14NF12FP
7150 BC857CW
7151 BC556B
7152 BC847CW
7153 BC847CW
7154 BC847CW
7155 BC847CW
7156 BC856BW
7157 BC856BW
7158 2SC2240
7159 BC847CW
7160 BC857CW
7161 2SA1954
7162 STP14NF12FP
7163 BC857CW
7164 2SA1954
7165 STP14NF12FP
7167 BC846BW
7168 BC856BW
5100 83R
5102 83R
5105 27u
5151 83R
5152 83R
5155 27u
6103 PDZ-3.3B
6156 PDZ-3.3B
6108 PDZ-12B
6154 PDZ-12B
6107 BAS316
6110 BAS316
6155 BAS316
6160 BAS316
1PS76SB10
1SS370
3104 213 3536 pt2 dd wk0343

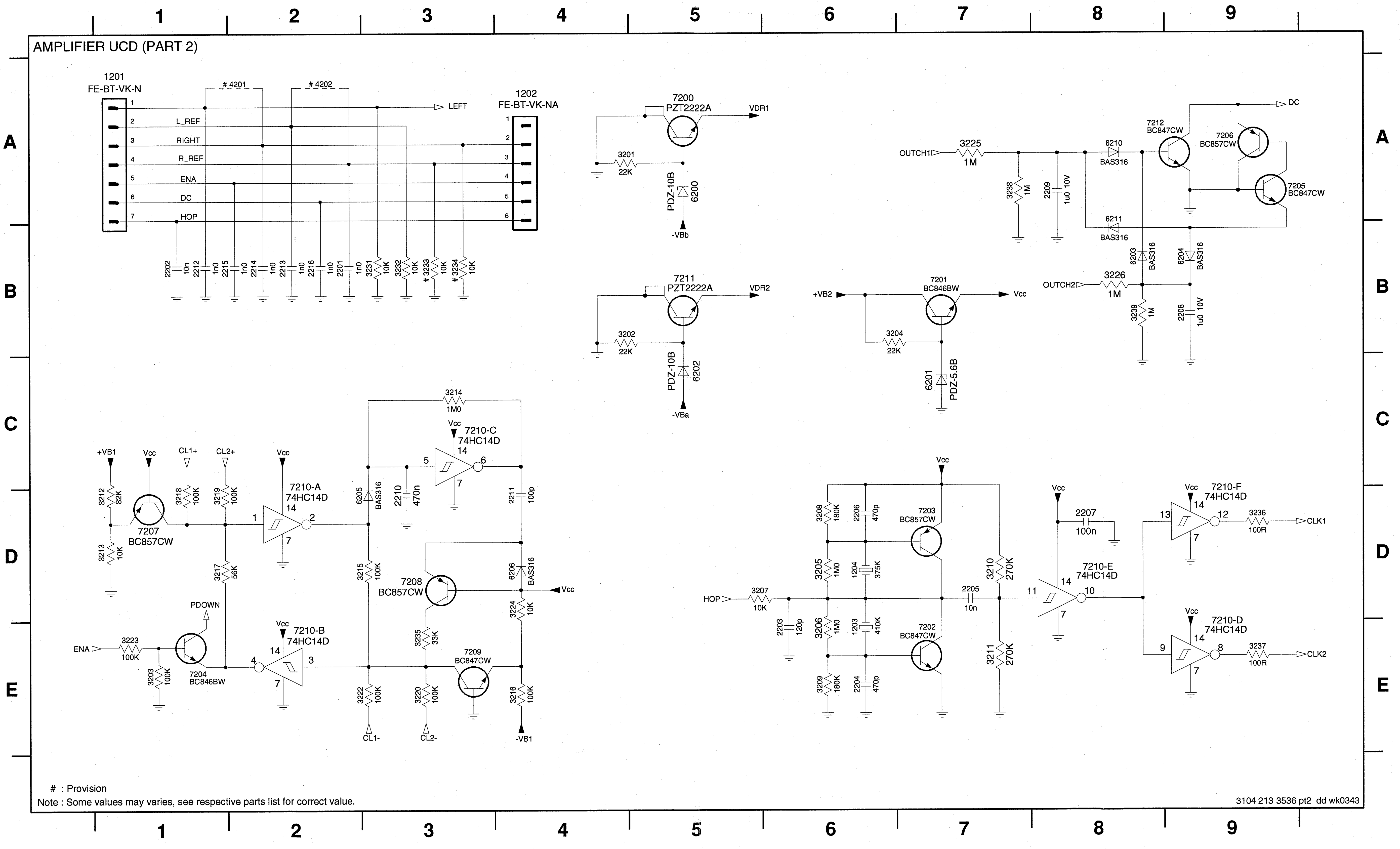
: Provision

Note : Some values may varies, see respective parts list for correct value.

1100	C1
1105	F1
1110	D12
1115	D13
1120	D13
2100	B2
2101	E1
2102	E1
2107	B3
2108	B3
2109	C2
2110	C3
2111	C3
2112	A4
2113	E4
2114	A9
2115	A10
2116	A11
2117	A10
2118	C7
2119	C7
2120	B10
2121	D7
2122	C8
2123	E9
2124	E10
2125	D10
2126	E10
2127	D10
2128	C12
2129	C12
2150	G2
2151	G3
2152	G3
2153	H2
2154	H3
2155	H3
2156	F4
2157	J4
2158	H7
2159	G7
2160	G10
2161	I7
2162	H8
2163	H10
2164	F9
2165	F10
2166	F10
2167	F11
2168	J9
2169	I10
2170	J10
2171	J10
2172	H12
2173	H12
3100	B3
3101	B3
3102	B3
3103	G4
3104	G5
3105	G2
3106	H2
3112	B3
3113	B3
3114	C3
3115	C3
3116	C3
3117	C3
3118	C3
3119	A4
3120	A5
3121	B5
3122	C4
3123	E4
3124	E5
3125	E6
3126	E6
3127	E6
3128	A6
3129	A6
3130	A7
3131	A10
3132	A10
3134	B7
3135	B8
3136	C9
3137	B10
3138	D7
3139	D8
3140	D9
3141	E10
3142	D10
3144	C10
3145	E4
3150	G3
3151	G3
3152	G3
3153	G3
3154	G2
3155	H3
3156	H3
3157	H3
3158	H3
3160	H2
3161	H2
3162	F4
3163	F5
3164	F6
3165	F6
3166	G5
3167	J4
3168	J5
3169	J6
3170	J6
3171	J6
3172	H4
3173	G7
3174	G8
3175	G9
3176	F7
3177	F10
3178	I7
3179	H8
3180	I9
3181	H10
3182	F10
3183	C4
3184	J10
3185	I10
3186	H4
3187	F10
3188	J4
3190	D1
3192	G2
3193	D11
3194	J12
3195	A11
3196	E11
3197	F11
3198	J11
5100	A9
5102	E9
5105	C12
5151	F9
5152	J9
5155	G12
6101	D5
6102	D4
6103	C7
6104	C7
6105	C7
6106	B8
6107	B9
6108	C8
6109	D8
6110	D9
6151	I4
6152	H5
6153	G8
6154	G8
6155	G9
6156	H7
6157	H7
6158	H7
6159	I8
6160	H9
7100	C4
7101	B5
7102	A4
7103	D4
7104	D4
7105	C6
7106	D5
7107	D6
7108	B6
7109	D6
7110	A11
7111	B8
7112	B9
7113	B9
7114	C8
7115	D9
7116	D11
7117	C9
7150	F5
7151	F4
7152	I6
7153	I4
7154	I4
7155	I6
7156	H4
7157	H6
7158	G6
7159	I6
7160	G8
7161	G9
7162	F9
7163	H8
7164	I9
7165	H9
7167	I11
7168	F11

AMPLIFIER UCD BOARD (SE) - CIRCUIT DIAGRAM PART 2

1201 A1	2201 B2	2205 D7	2209 A8	2213 B2	3201 A4	3205 D6	3209 E6	3213 D1	3217 D1	3222 E3	3226 B8	3234 B3	3238 A7	6200 A5	6204 B9	6211 B8	7203 D7	7207 D1	7210-B E2	7210-F D9
1202 A4	2202 B1	2206 D6	2210 D3	2214 B2	3202 B4	3206 E6	3210 D7	3214 C3	3218 D1	3223 E1	3231 B3	3235 E3	3239 B8	6201 C7	6205 D2	7200 A5	7204 E1	7208 D3	7210-C C3	7211 B5
1203 E6	2203 E6	2207 D8	2211 D4	2215 B1	3203 E1	3207 D5	3211 E7	3215 D3	3219 D1	3224 D4	3232 B3	3236 D9	4201 A2	6202 C5	6206 D4	7201 B7	7205 A9	7209 E3	7210-D E9	7212 A8
1204 D6	2204 E6	2208 B9	2212 B1	2216 B2	3204 B6	3208 D6	3212 D1	3216 E4	3220 E3	3225 A7	3233 B3	3237 E9	4202 A2	6203 B8	6210 A8	7202 E7	7206 A9	7210-A D2	7210-E D8	


1
2
3
4
5
6
7
8
9
A
B
C
D
E
AMPLIFIER UCD (PART 2)
1201
FE-BT-VK-N
1202
FE-BT-VK-NA
# 4201
# 4202
LEFT
L_REF
RIGHT
R_REF
ENA
DC
HOP
2202 10n
2212 1n0
2215 1n0
2214 1n0
2213 1n0
2216 1n0
2201 1n0
3231 10K
3232 10K
# 3233 10K
# 3234 10K
7200
PZT2222A
VDR1
3201
22K
PDZ-10B
6200
-VBb
7211
PZT2222A
VDR2
3202
22K
PDZ-10B
6202
-VBa
+VB2
7201
BC846BW
Vcc
3204
22K
6201
PDZ-5.6B
OUTCH1
3225
1M
3238 1M
2209 1u0 10V
6210
BAS316
7212
BC847CW
7206
BC857CW
7205
BC847CW
DC
6211
BAS316
6203 BAS316
6204 BAS316
OUTCH2
3226
1M
3239 1M
2208 1u0 10V
3214
1M0
7210-C
74HC14D
+VB1
Vcc
CL1+
CL2+
3212 82K
3213 10K
7207
BC857CW
3218 100K
3219 100K
3217 56K
7210-A
74HC14D
6205 BAS316
2210 470n
2211 100p
3215 100K
7208
BC857CW
6206 BAS316
3224 10K
PDOWN
ENA
3223
100K
3203 100K
7204
BC846BW
7210-B
74HC14D
3235 33K
7209
BC847CW
3222 100K
3220 100K
3216 100K
CL1-
CL2-
-VB1
3208 180K
2206 470p
7203
BC857CW
3205 1M0
1204 375K
HOP
3207
10K
2203 120p
3206 1M0
1203 410K
7202
BC847CW
3209 180K
2204 470p
3210 270K
2205
10n
3211 270K
2207
100n
7210-E
74HC14D
7210-F
74HC14D
3236
100R
CLK1
7210-D
74HC14D
3237
100R
CLK2

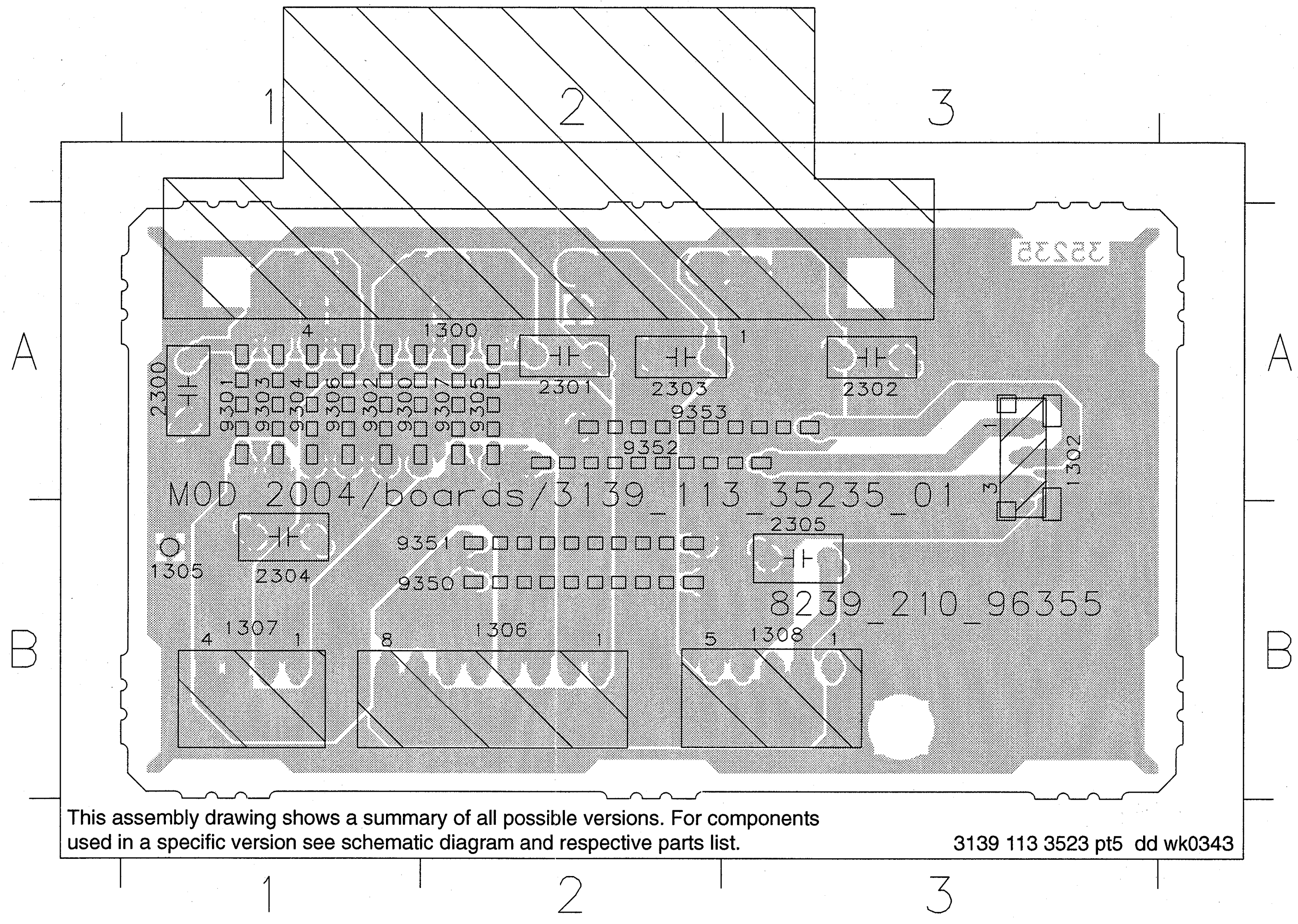
: Provision

Note : Some values may varies, see respective parts list for correct value.

3104 213 3536 pt2 dd wk0343

SPEAKER UCD BOARD - COMPONENT LAYOUT

Item	Position
1300	A2
1302	A3
1305	B1
1306	B2
1307	B1
1308	B3
2300	A1
2301	A2
2302	A3
2303	A2
2304	B1
2305	B3
9300	A1
9301	A1
9302	A1
9303	A1
9304	A1
9305	A2
9306	A1
9307	A2
9350	B2
9351	B2
9352	A2
9353	A2

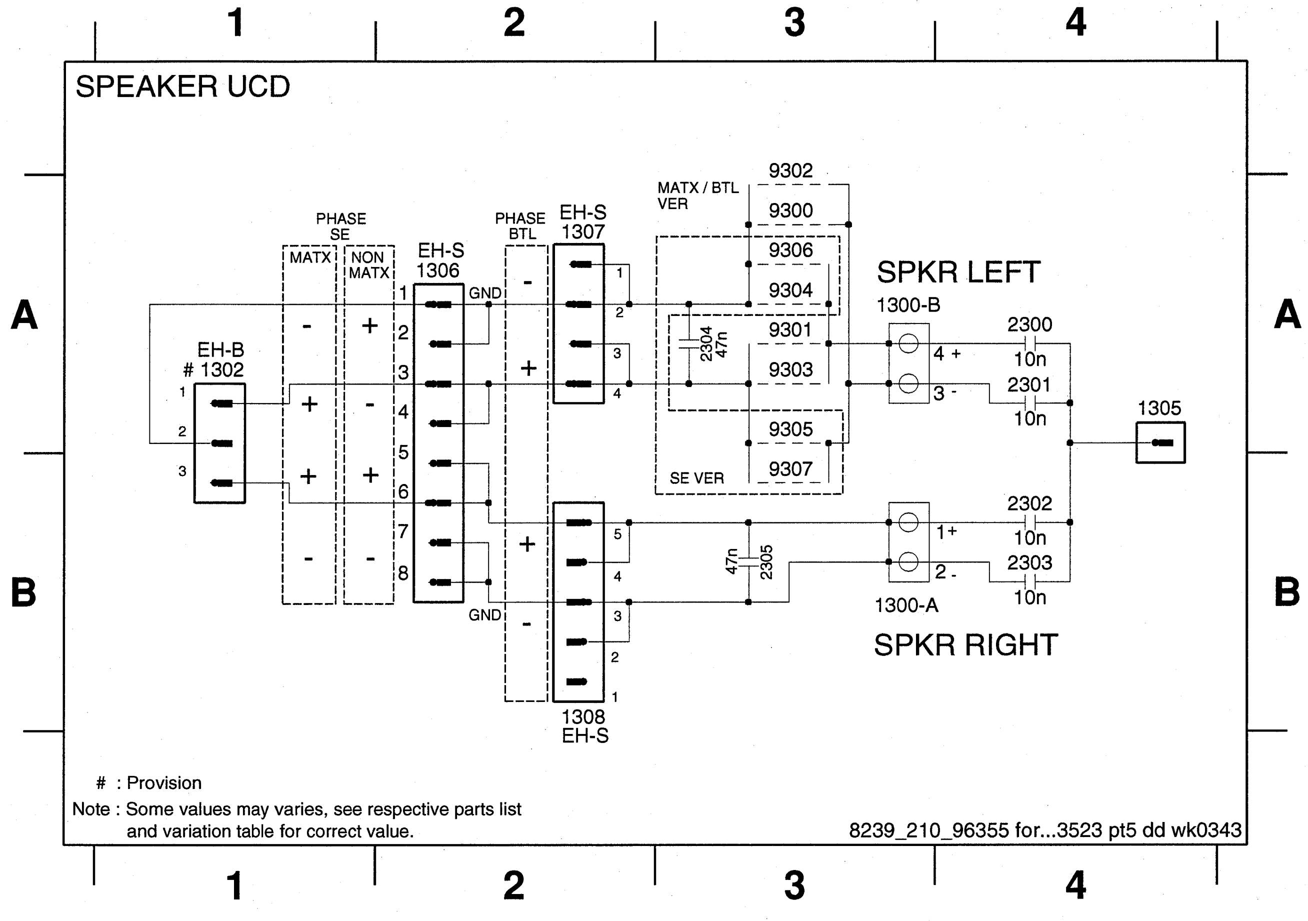

1
2
3
A
B
35235
1300
4
1
2300
9301
9303
9304
9306
9302
9300
9307
9305
2301
2303
2302
9353
9352
1302
MOD 2004/boards/3139_113_35235_01
2305
1305
2304
9351
9350
8239_210_96355
1307
1306
1308
4
8
5

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

3139 113 3523 pt5 dd wk0343

SPEAKER UCD BOARD - CIRCUIT DIAGRAM

Item	Position
1300-A	B3
1300-B	A3
1302	A1
1305	A4
1306	A2
1307	A2
1308	B2
2300	A4
2301	A4
2302	B4
2303	B4
2304	A3
2305	B3
9300	A3
9301	A3
9302	A3
9303	A3
9304	A3
9305	A3
9306	A3
9307	B3


1
2
3
4
A
B
SPEAKER UCD
EH-B
# 1302
PHASE SE
MATX
NON MATX
EH-S 1306
PHASE BTL
EH-S 1307
GND
MATX / BTL VER
9302
9300
9306
9304
9301
9303
9305
9307
SE VER
2304 47n
SPKR LEFT
1300-B
4 +
3 -
2300 10n
2301 10n
1305
2302 10n
2303 10n
1+
2-
1300-A
47n 2305
SPKR RIGHT
1308 EH-S

: Provision

Note : Some values may varies, see respective parts list and variation table for correct value.

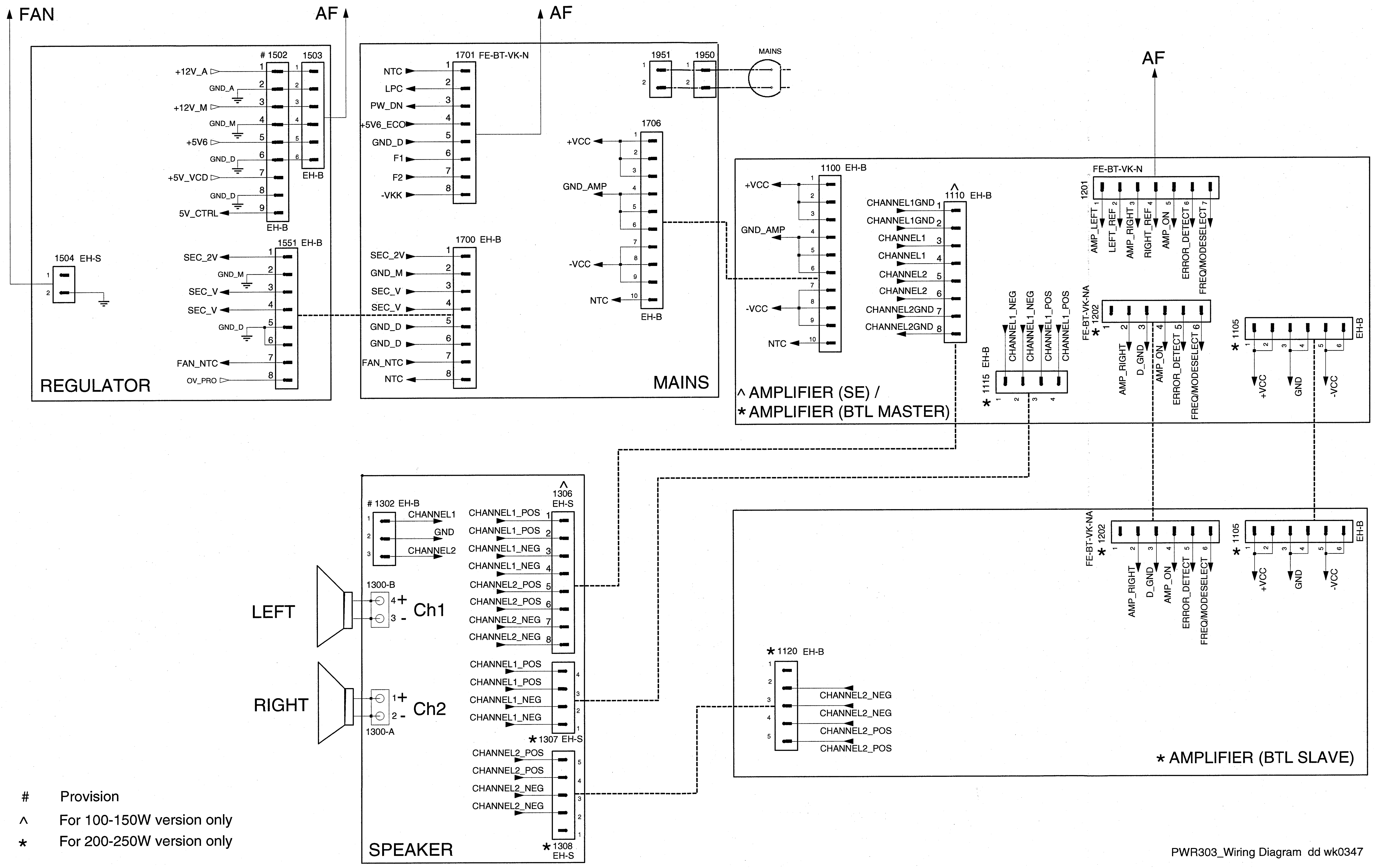
8239_210_96355 for...3523 pt5 dd wk0343

SPEAKER UCD BOARD - VARIATION TABLE

	SPEAKER UCD BOARD	
Item No.	100-150W (Non Matrix Version)	200-250W
1302	-	-
1306	X	-
1307 , 1308	-	X
2304 , 2305	-	X
9300 , 9301	-	X
9302 , 9303	-	X
9304 , 9305	X	-
9306 , 9307	X	-

X - item in use.

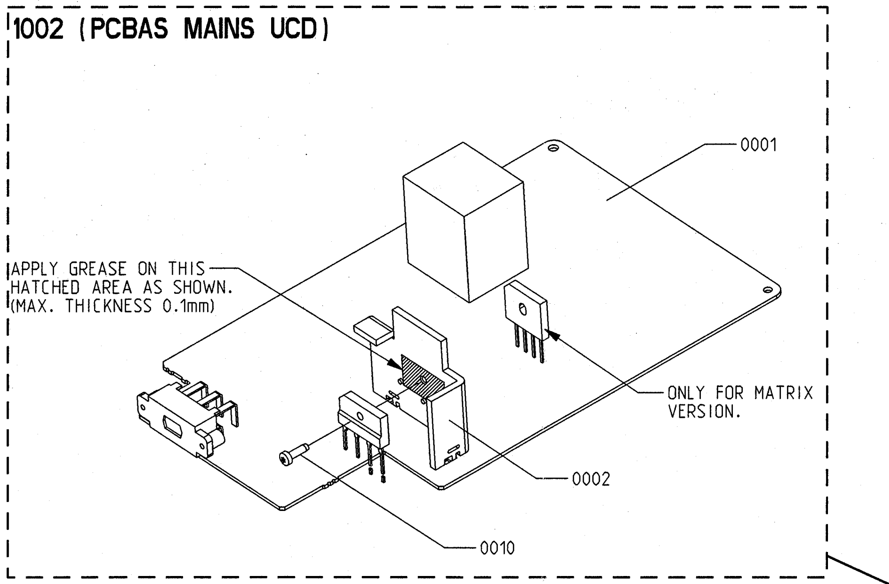
WIRING DIAGRAM

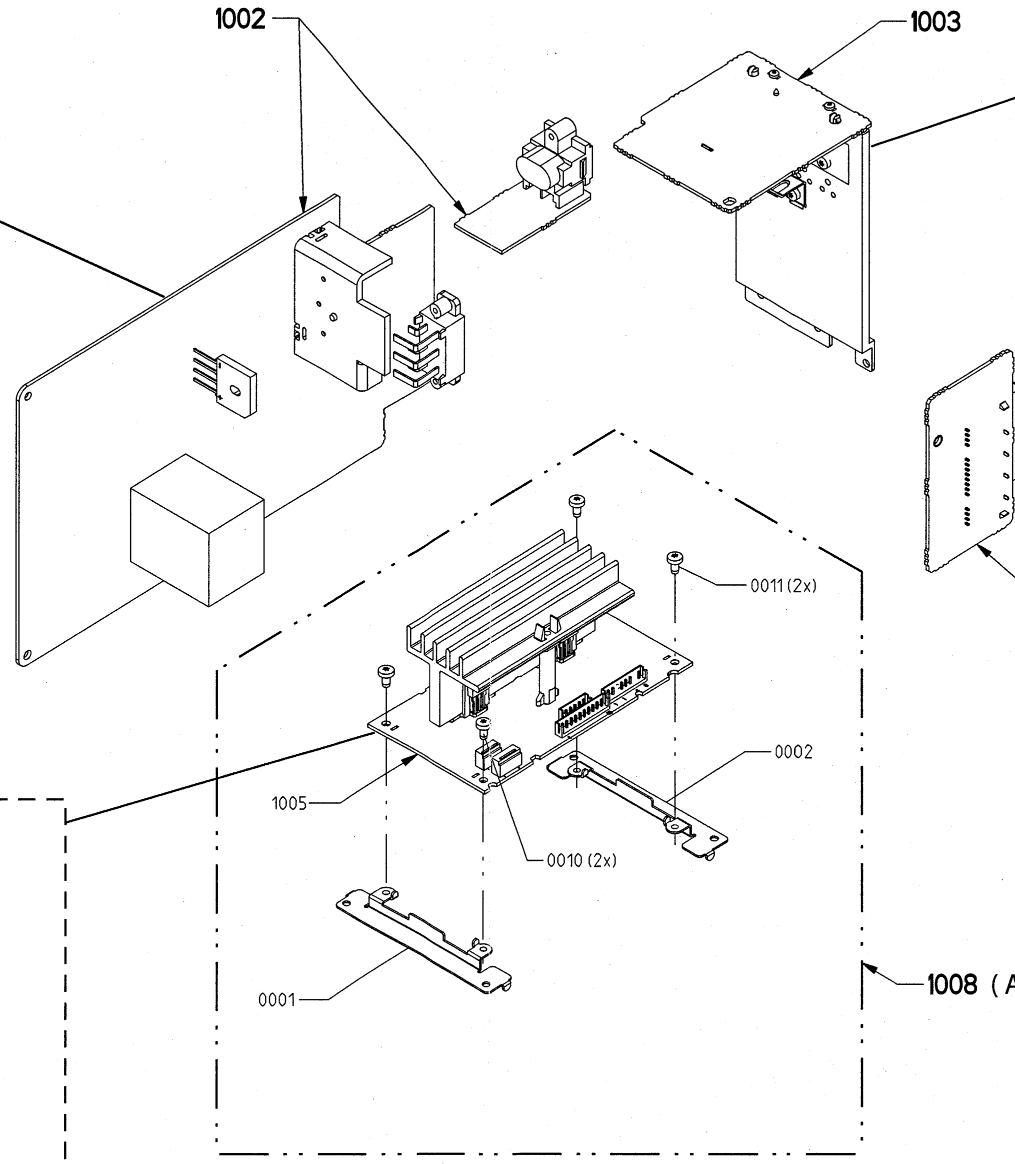

FAN
AF
AF
AF
REGULATOR
# 1502
1503
EH-B
EH-B
+12V_A
GND_A
+12V_M
GND_M
+5V6
GND_D
+5V_VCD
GND_D
5V_CTRL
1504 EH-S
1551 EH-B
SEC_2V
GND_M
SEC_V
SEC_V
GND_D
FAN_NTC
OV_PRO
MAINS
1701 FE-BT-VK-N
NTC
LPC
PW_DN
+5V6_ECO
GND_D
F1
F2
-VKK
1700 EH-B
SEC_2V
GND_M
SEC_V
SEC_V
GND_D
GND_D
FAN_NTC
NTC
1951
1950
MAINS
1706
EH-B
+VCC
GND_AMP
-VCC
NTC
^ AMPLIFIER (SE) /
* AMPLIFIER (BTL MASTER)
1100 EH-B
+VCC
GND_AMP
-VCC
NTC
^ 1110 EH-B
CHANNEL1GND
CHANNEL1GND
CHANNEL1
CHANNEL1
CHANNEL2
CHANNEL2
CHANNEL2GND
CHANNEL2GND
FE-BT-VK-N
1201
AMP_LEFT
LEFT_REF
AMP_RIGHT
RIGHT_REF
AMP_ON
ERROR_DETECT
FREQ/MODESELECT
* 1115 EH-B
CHANNEL1_NEG
CHANNEL1_NEG
CHANNEL1_POS
CHANNEL1_POS
FE-BT-VK-NA
* 1202
AMP_RIGHT
D_GND
AMP_ON
ERROR_DETECT
FREQ/MODESELECT
* 1105
EH-B
+VCC
GND
-VCC
SPEAKER
# 1302 EH-B
CHANNEL1
GND
CHANNEL2
^ 1306 EH-S
CHANNEL1_POS
CHANNEL1_POS
CHANNEL1_NEG
CHANNEL1_NEG
CHANNEL2_POS
CHANNEL2_POS
CHANNEL2_NEG
CHANNEL2_NEG
1300-B
LEFT
Ch1
RIGHT
Ch2
1300-A
CHANNEL1_POS
CHANNEL1_POS
CHANNEL1_NEG
CHANNEL1_NEG
* 1307 EH-S
CHANNEL2_POS
CHANNEL2_POS
CHANNEL2_NEG
CHANNEL2_NEG
* 1308 EH-S
* AMPLIFIER (BTL SLAVE)
FE-BT-VK-NA
* 1202
AMP_RIGHT
D_GND
AMP_ON
ERROR_DETECT
FREQ/MODESELECT
* 1105
EH-B
+VCC
GND
-VCC
* 1120 EH-B
CHANNEL2_NEG
CHANNEL2_NEG
CHANNEL2_POS
CHANNEL2_POS

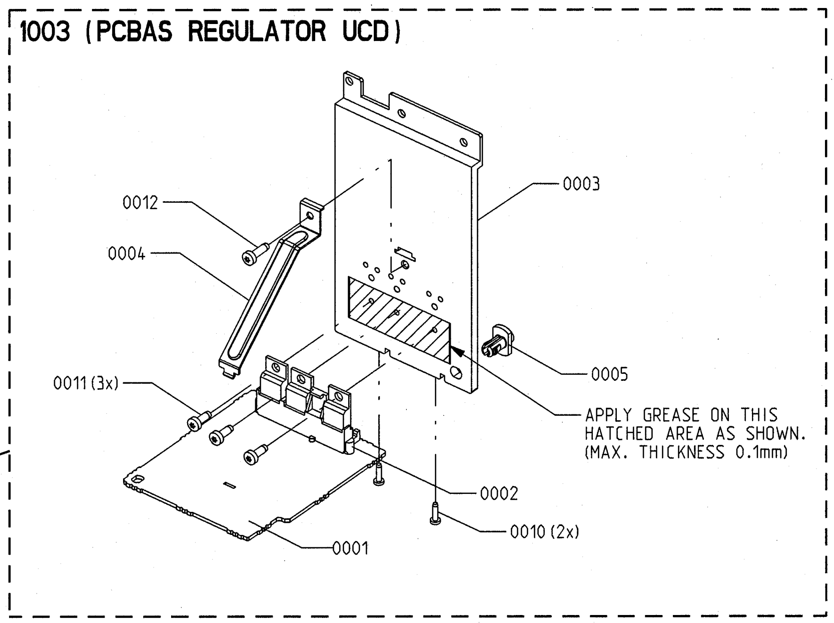
#	Provision
^	For 100-150W version only
*	For 200-250W version only

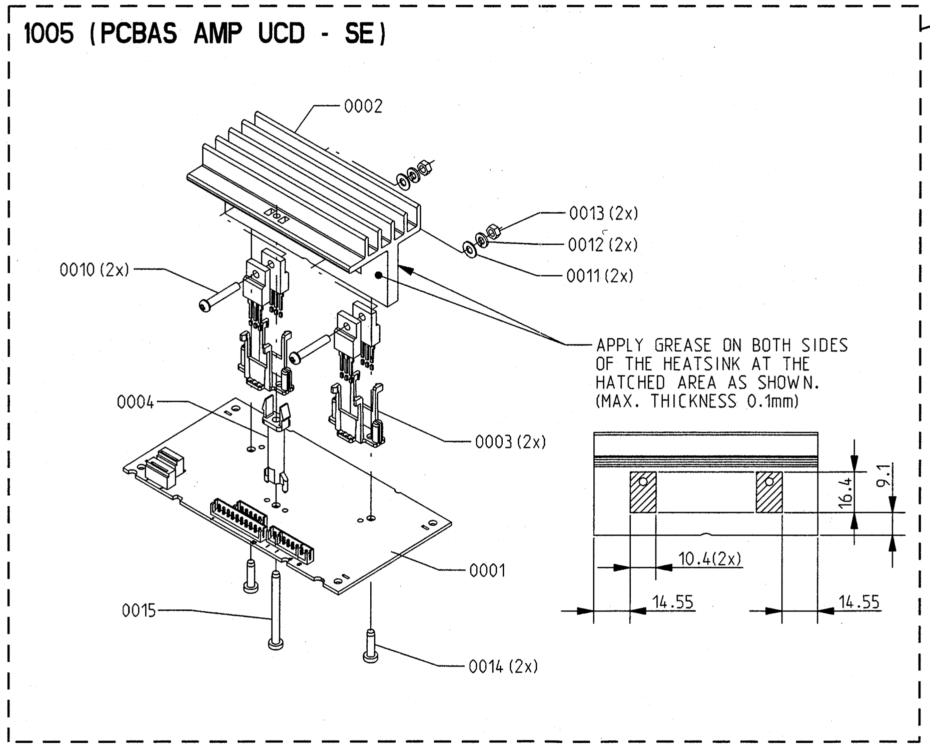
PWR303_Wiring Diagram dd wk0347

EXPLODED VIEW


1002 (PCBAS MAINS UCD)
0001
APPLY GREASE ON THIS HATCHED AREA AS SHOWN. (MAX. THICKNESS 0.1mm)
ONLY FOR MATRIX VERSION.
0002
0010


1002
1003
1004 (PCBAS SPEAKER UCD)
0011 (2x)
0002
1005
0010 (2x)
0001
1008 (ASSY UCD SE)


1003 (PCBAS REGULATOR UCD)
0012
0004
0003
0011 (3x)
0005
APPLY GREASE ON THIS HATCHED AREA AS SHOWN. (MAX. THICKNESS 0.1mm)
0002
0010 (2x)
0001


1005 (PCBAS AMP UCD - SE)
0002
0013 (2x)
0012 (2x)
0011 (2x)
0010 (2x)
APPLY GREASE ON BOTH SIDES OF THE HEATSINK AT THE HATCHED AREA AS SHOWN. (MAX. THICKNESS 0.1mm)
0004
0003 (2x)
0001
0015
0014 (2x)
16.4
9.1
10.4(2x)
14.55
14.55

SCREW LISTS

ASSY UCD SE

0010	M3 x 6
0011	M3 x 6

PCBAS MAINS UCD

0010	D3 x 10

PCBAS REGULATOR UCD

0010	D2 x 8
0011	D2.5 x 8
0012	D3 x 10

PCBAS AMP UCD - SE

0010	M3 x 18
0014	D3 x 12
0015	D3 x 35

ELECTRICAL PARTS - MAINS UCD BOARD

1704	⚠	994000001873	FUSE T6.3A 250V
1705	⚠	994000001873	FUSE T6.3A 250V
1707	⚠	994000001885	FUSE RAD T 2A IEC250V
1708	⚠	994000001885	FUSE RAD T 2A IEC250V
1902	⚠	994000001886	FUSE RAD LT 3A15 250V
1905		994000001032	RELAY 1P 12V 16A
1950	⚠	994000001879	MAINS SOCKET 2P 2A5 250V /22
1950	⚠	994000002251	CON MAINS 2P 7A 125V /07
2711		994000001881	ELCAP 35V 6800uF PM20
2712		994000002253	ELCAP YK 16V S 10000U /07
2716		994000002254	ELCAP REA 50V S 3300U /07
2717		994000002254	ELCAP REA 50V S 3300U /37
2902		994000001876	CAP MPP 275V 22N PM20
2908		994000001877	CAP MPP 275V 220N PM20 /22
2908		994000002252	CAP MPP 275V S 470N PM20 /07
2918		482212614088	CERSAF NSA 250V 2N2
2920		994000001878	CAP MKP 275V 100N PM20
3700	⚠	994000001887	RST FUSE NFR25 100R PM5
3701	⚠	994000001887	RST FUSE NFR25 100R PM5
3707	⚠	994000001888	RST FUSE NFR25 47R PM5
3902		994000001889	RST MFLM MBB0207 4M7 PM1
3912		994000001882	ST MGL 10M
5903		994000001874	FILTER TR-23-11-14 /22
5903		994000002249	FIL MAINS 650UH 6A 97TS /07
5904	⚠	996500016272	ST.BY TRANSFORMER
6712		994000001875	BRIDGE GBJ10D
		994000001883	NTC AC 300V DC 385V 0.8W

Note: **Only these parts mentioned in the list are normal service parts.**

ELECTRICAL PARTS - REGULATOR UCD BOARD

3514	⚠	994000001893	RST FUSE NFR25 5R6 PM5
3517		994000001868	NTC DC 0W5 10K PM5
7500		482220981351	IC VOITAGE REGULATOR
7504		482220981351	IC VOITAGE REGULATOR
		994000001891	STOPPER HEATSINK

Note: **Only these parts mentioned in the list are normal service parts.**

ELECTRICAL PARTS - SPEAKER UCD BOARD

1300	9965 000 16263	SPEAKER TERMINAL 4P

Note: **Only these parts mentioned in the list are normal service parts.**

ELECTRICAL PARTS - AMPLIFIER UCD BOARD

3122		994000001867	RTRM CAR LIN 220Ω H
3145	⚠	994000001871	PTC TFJPT0805L3901KZ
3172		994000001867	RTRM CAR LIN 220Ω H
3188		994000001871	PTC TFJPT0805L3901KZ
3190	⚠	994000001868	NTC 0W5 10K PM5
3195		994000001869	NTC 0W1 4K7 PM5
3196		994000001869	NTC 0W1 4K7 PM5
3197		994000001869	NTC 0W1 4K7 PM5
3198		994000001869	NTC 0W1 4K7 PM5
5105		994000001866	IND FXD SC4684-145 PM1
5155		994000001866	IND FXD SC4684-145 PM1
7112		994000001865	FET POW STP14NF12FP
7117		994000001865	FET POW STP14NF12FP
7162		994000001865	FET POW STP14NF12FP
7165		994000001865	FET POW STP14NF12FP
7210		532220911548	IC 74HC14D

Note: **Only these parts mentioned in the list are normal service parts.**

ETF7 TAPE MODULE

(Non-Dolby Version)

TABLE OF CONTENTS

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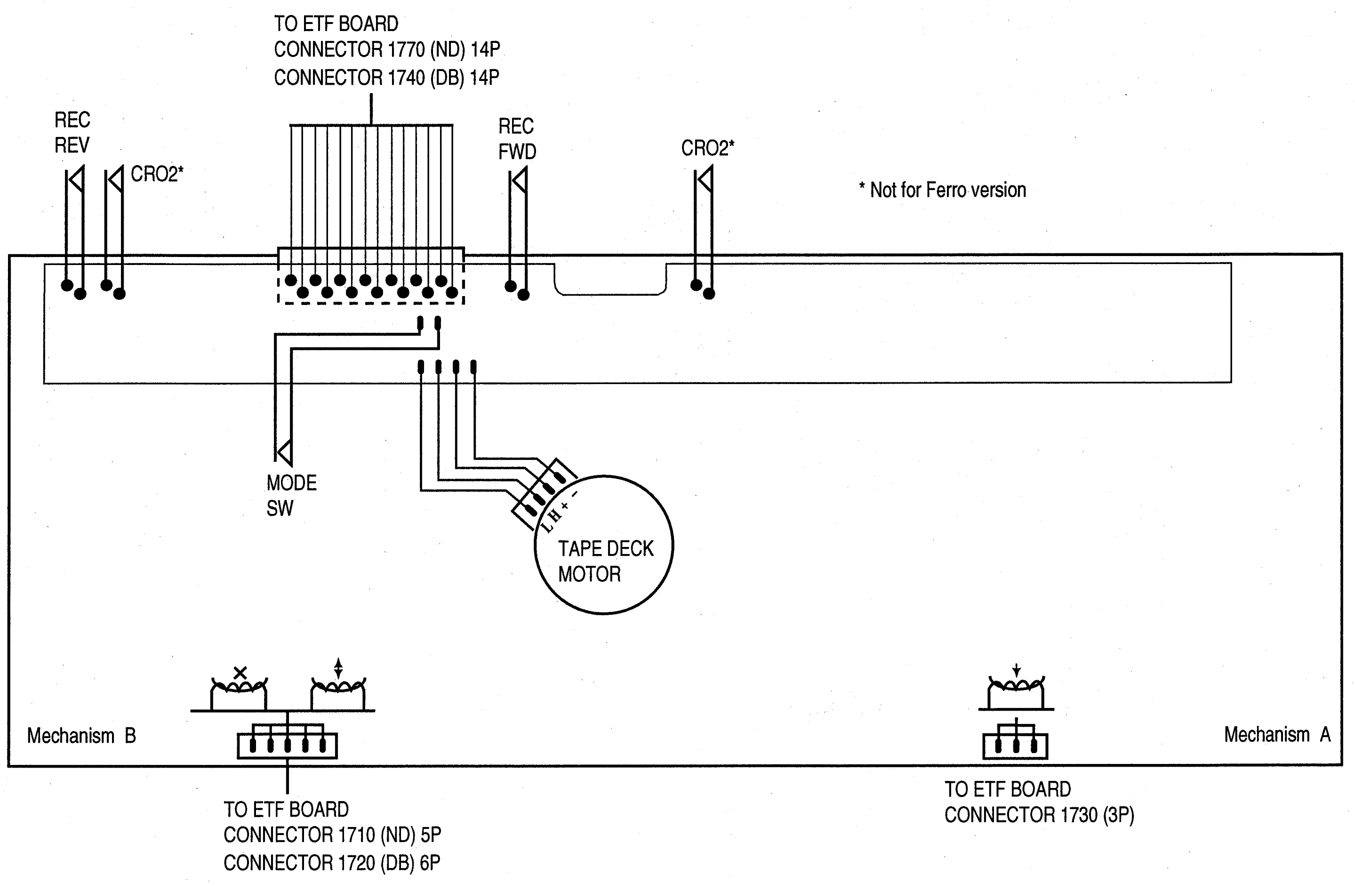
Analog Circuit diagram 9-7
Servo Circuit diagram 9-8
Exploded views & parts list.. 9-9
Electrical parts list.. 9-13

Tapedeck wiring (Double deck)

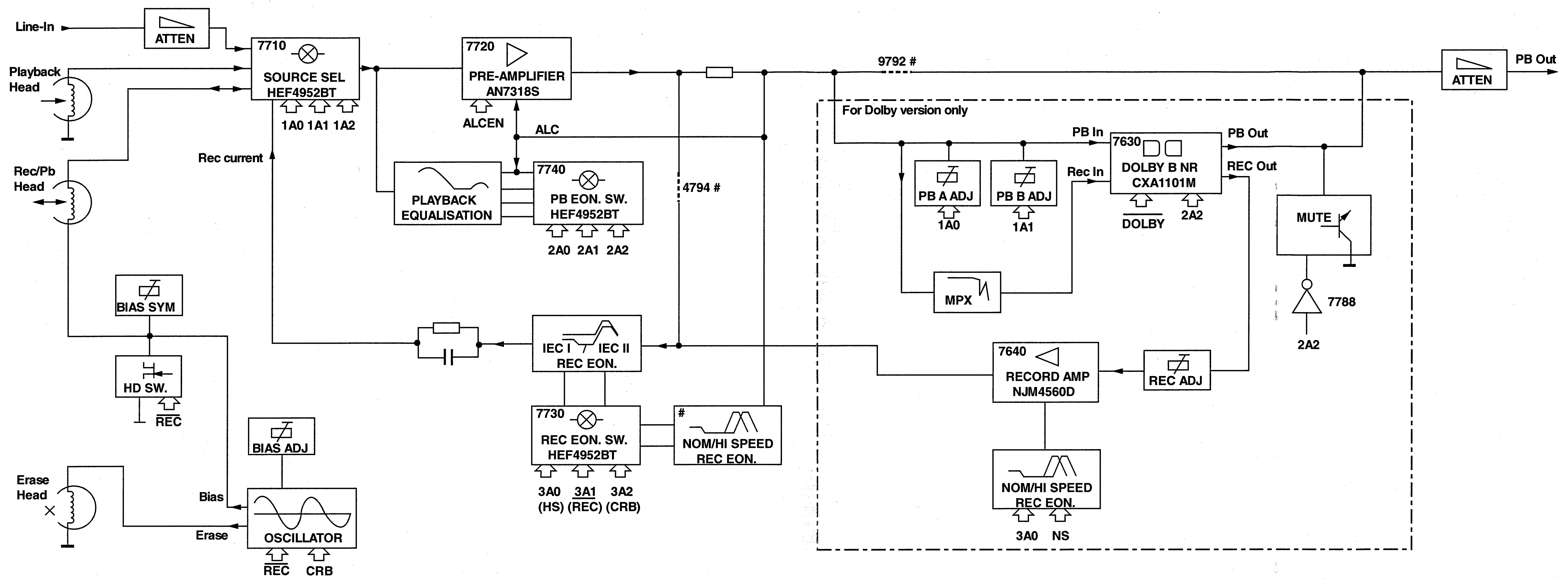

TO ETF BOARD
CONNECTOR 1770 (ND) 14P
CONNECTOR 1740 (DB) 14P
REC
REV
CRO2*
REC
FWD
CRO2*
* Not for Ferro version
MODE
SW
L
H
+
-
TAPE DECK
MOTOR
Mechanism B
Mechanism A
TO ETF BOARD
CONNECTOR 1710 (ND) 5P
CONNECTOR 1720 (DB) 6P
TO ETF BOARD
CONNECTOR 1730 (3P)

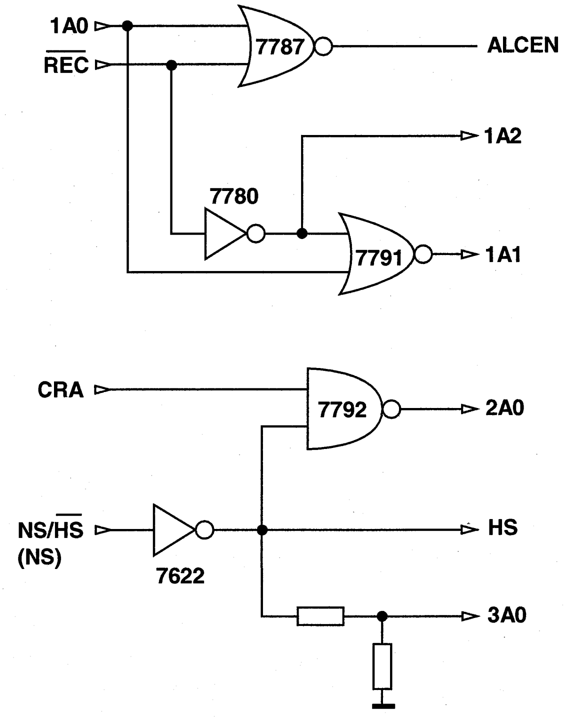
Variations table for Analog Circuit

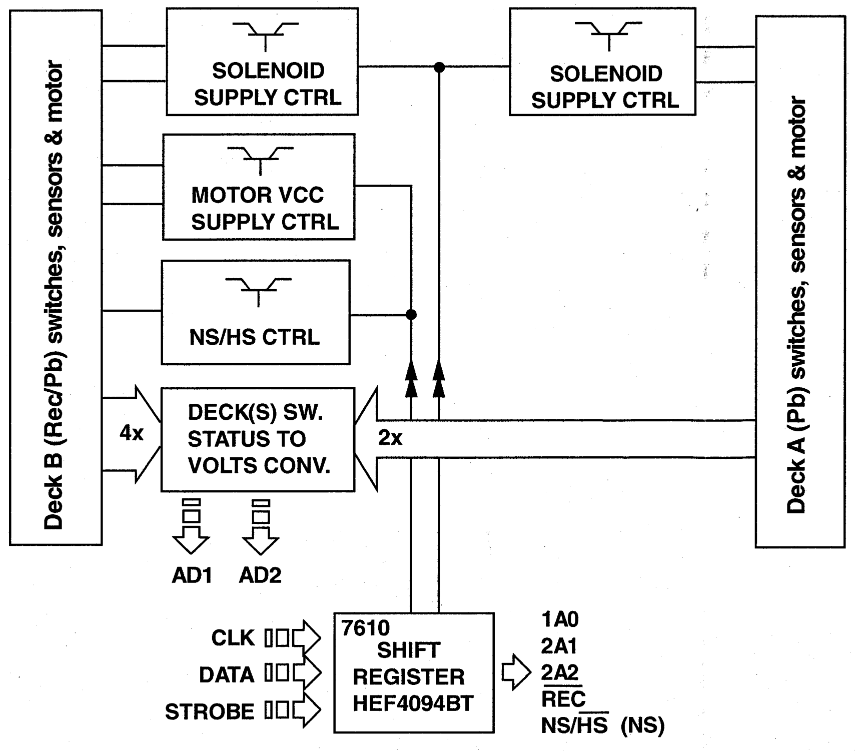
	Autoreverse ND/DD/FR	Non-autoreverse ND/DD/FF	
	Chrome/Ferro	Chrome/Ferro	Ferro
2624	-	-	100nF
2701 , 2702	150pF	270pF	270pF
2703 , 2704	100pF	220pF	220pF
2717 , 2718	10nF	15nF	15nF
2721 , 2722	6,8nF	6,8nF	-
2727 , 2728	470pF	1nF	1nF
3616	10k	1k	1k
3618	6k8	-	-
3620	10k trimmer	-	-
3622	-	10k trimmer	10k trimmer
3672	4k7	-	-
3676	47k	-	-
3687	220R	220R	-
3688	680R	-	-
3723 , 3724	15k	18k	18k
3725 , 3726	10R	10R	-
3727 , 3728	5k6	6k8	6k8
3729 , 3730	3k3	4k7	4k7
3743 , 3744	1k5	2k2	2k2
3745 , 3746	3k3	5k6	5k6
3754 , 3755	1M	47R	47R

	Autoreverse ND/DD/FR	Non-autoreverse ND/DD/FF	
	Chrome/Ferro	Chrome/Ferro	Ferro
3769	12k	8k2	8k2
3772	6k8	5k6	5k6
4785	-	-	0R jumper
3774	15k	8k2	8k2
6614	1N4148	-	-
7616	BC857B	-	-
7622	BC847B	-	-

BLOCK DIAGRAM


Line-In
ATTEN
Playback Head
Rec/Pb Head
Erase Head
7710
SOURCE SEL
HEF4952BT
1A0 1A1 1A2
Rec current
7720
PRE-AMPLIFIER
AN7318S
ALCEN
ALC
PLAYBACK EQUALISATION
7740
PB EQN. SW.
HEF4952BT
2A0 2A1 2A2
4794 #
9792 #
ATTEN
PB Out
For Dolby version only
PB In
7630
DOLBY B NR
CXA1101M
PB Out
REC Out
Rec In
DOLBY
2A2
PB A ADJ
1A0
PB B ADJ
1A1
MPX
MUTE
7788
2A2
BIAS SYM
HD SW.
REC
BIAS ADJ
Bias
Erase
OSCILLATOR
REC CRB
IEC I IEC II
REC EQN.
7730
REC EQN. SW.
HEF4952BT
3A0 3A1 3A2
(HS) (REC) (CRB)
#
NOM/HI SPEED
REC EQN.
7640
RECORD AMP
NJM4560D
REC ADJ
NOM/HI SPEED
REC EQN.
3A0 NS


1A0
REC
7787
ALCEN
1A2
7780
7791
1A1
CRA
7792
2A0
NS/HS
(NS)
7622
HS
3A0


Deck B (Rec/Pb) switches, sensors & motor
SOLENOID SUPPLY CTRL
MOTOR VCC SUPPLY CTRL
NS/HS CTRL
4x
DECK(S) SW. STATUS TO VOLTS CONV.
2x
AD1
AD2
SOLENOID SUPPLY CTRL
Deck A (Pb) switches, sensors & motor
CLK
DATA
STROBE
7610
SHIFT REGISTER
HEF4094BT
1A0
2A1
2A2
REC
NS/HS (NS)

NOTE: # For Non-dolby version only
Only 1 channel is presented.

▯▯⇨ MicroProcessor Control / Communication lines

⇨ Direct / Indirect Control lines from Shift Registers

Brief introduction

General

1. Playback Mode
   Signal from the playback head Deck A or Deck B is selected and fed through by the Mode Selector IC7710 (HEF4952BT). The signal is amplified by amplifier IC7720 (AN7323S) before feeding to the IC7740 (HEF4952BT) and out to the AF Board via connector 1701.

2. Recording Mode
   Recording Signal is selected and fed through by the Mode Selector IC7710 (HEF4952BT) which is then amplified by the amplifier IC7720 (AN7323S). The amplified output signal will pass through IC7730 (HEF4952BT) for record equalization and back to IC7710 (HEF4952BT) before registered into the Rec/PB Head of Deck B.

3. Dubbing Mode
   In Dubbing mode, signal from the playback head Deck A is selected and fed through by the Mode Selector IC7710 (HEF4952BT) which is then equalised for playback mode by the amplifier IC7720 (AN7323S) so that a flat response is obtained after the pre-amp. The equalised signal will then follow the same path as in the Recording mode.

4. Mode Selector
   The Mode Selector IC7710 (HEF4952BT) caters for 4 inputs signal, namely Playback Signal from Deck A, Playback Signal from Deck B, Recording Signal and Dubbing Signal.

5. Amplifier PB/REC
   Amplifier IC7720 (AN7323S) is for the purpose of amplifying the Playback and Recording signal from the Mode Selector.

6. Automatic Level Control (ALC)
   ALC circuit consists of resistors (3760, 3765, 3766, 3767), capacitors (2762 , 2763) and control by transistor 7787 (BC847B). ALC limits the amplifier output to a constant value when input signal becomes too large, thus limiting recording current to below saturation level, to prevent recording distortion.

7. Muting Circuit (For Non-Dolby version only)
   Switch S4 of the IC7740 (HEF4952BT) is for the purpose of muting the output during Recording mode. During Recording mode, S4 is closed and shorted to the ground.

8. IC7740 (HEF4952BT)
   The function of the IC7740 (HEF4952BT) is to change time constant between 120us Ferro (IEC I) and 70us Chrome (IEC II) during playback mode. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II). This IC will switch to Flat Gain during the Recording mode.

9. IC7730 (HEF4952BT)
   The function of the IC7730 (HEF4952BT) is to change gain and time constant according to tape type and recording speed to boost recording current at higher frequency during recording to compensate for head loss. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II).

10. Bias Level
    Bias Level making use of the Variable resistor (3773) for adjusting the optimal level of the bias current for Ferro or Chrome.

11. Bias Symm (For Dolby B NR version only)
    Bias Symm making use of the Variable resistor (3785) to adjust the bias current for the left and the right channel to be equal.

12. PB Switch
    Playback Switch which consists of the FETs 7785 (For Dolby B NR version only) & 7786 (J111) is for the purpose of providing a virtual ground for the Rec/PB Head (Deck B) during Playback mode. During the Playback mode, the FETs are turn on and shorted pin 2 and 4 of connector 1720 to the ground. During Recording mode, the FETs are turn off to allow the oscillator signal to be superposition onto the Recording signal for recording.

13. Motor Speed (For FR versions only)
    During High speed dubbing, a feedback signal from the uP through pin 03 of the IC7610 (HEF4094BT) will trigger the transistors 7622 (BC847B) and 7616 (BC857B) to cause a change in the voltage level between High and Low, thus changing the speed of the motor.

14. IC7610 (HEF4094BT)
    IC7610 (HEF4094BT) is a Shift Register use for issues the logic for cmos switch ICs (HEF4952BT) via 1A0, 2A1 and 2A2. It also issues logic to On/Off SOL_A, SOL_B and MOT. Recording speed is controlled via NS/HS.

Dolby Circuit (For sets with Dolby B NR version only)

15. IC7630 (CXA1551M)
    IC7630 (CXA1551M) in the Dolby circuit is a Dolby Noise Reduction Type B IC for the Playback and Recording signal. Noise Reduction ON/OFF are controlled by $\overline{\text{DOLBY}}$, which is from CLK, direct from uP. After clocking in DATA, CLK is set to HIGH/LOW for NR OFF/ON.

16. 19kHz Filter
    The 19kHz filters 5631 & 5632 (LXD-210) in the Dolby circuit is for the purpose of filtering the 19kHz Pilot Tone (for Tuner signal only) of the Recording signal.

17. Level Adjust
    The Variable resistor 3635, 3636,3641 and 3642 in the Dolby circuit is for adjusting the playback level of the Dolby reference (400Hz , 200nWb/m). Transistor 7631, 7632 are ON to enable adjustment of 3641, 3642 during Playback Deck A. Transistor 7633, 7634 and 3635, 3636 are active for Playback Deck B.

18. Amplifier IC7640 (NJM4560M)
    The Amplifiers 7640A & 7640B (NJM4560M) in the Dolby circuit is for the purpose of amplified the Recording signal.

19. Muting Circuit
    The muting circuit which consists of transistors 7788, 7789 and 7790 (BC847B) is for the purpose of muting the output during Recording mode.

NOTATIONS & ABBREVIATIONS USED IN THIS DOCUMENT

CR	Chrome (IEC type II)
DB	Dolby NR type B
DD	Double Deck
DM	Double Motor
FE	Ferro (IEC type I)
FF	Non-Autoreverse
FR	Autoreverse Deck B
Gnd x	Ground x
HSD	High speed dubbing
ND	Non Dolby
NR	Noise Reduction
NSD	Normal speed dubbing
PB	Playback
REC	Record
S/A	Sub-assy
SD	Single Deck
SM	Single Motor

CONNECTORS ASSIGNMENTS:

CONNECTOR 1701 — INTERCONNECTION TO AF BOARD

	Pin	Signal	Description
○	1	REC-L	Record input left
○	2	REC-R	Record input right
○	3	GND A	AF Ground
○	4	TAPE-L	Playback output left
○	5	+12V	D.C. supply (+12V) for AF electronics
○	6	TAPE-R	Playback output right
○	7	-CMOS	Negative d.c. supply (-9V) for CMOS ICs

CONNECTOR 1703 — INTERCONNECTION TO AF BOARD

	Pin	Signal	Description
○	1	GND M	Motor Ground
○	2	+MOTOR	D.C. supply (+12V) for tape deck motor & solenoid

CONNECTOR 1706 — INTERCONNECTION TO FRONT BOARD

	Pin	Signal	Description
○	1	AD2	Deck sensing switches output voltage / Deck A EOT
○	2	AD1	Deck sensing switches output voltage / Deck B EOT
○	3	+5V	DC supply +5V for ADC network
○	4	GND P	Control & Oscillator Ground
○	5	CLK	HEF4094BT shift register Clock line
○	6	DATA	HEF4094BT shift register Data line
○	7	STROBE	HEF4094BT shift register Strobe line

CONNECTOR 1710 — DECK B HEADS CONNECTON *(For Non-Dolby version only)*

	Pin	Signal	Description
○	1	B R/P HD L+	R/P Head left channel positive
○	2	GND A	R/P Head return ground
○	3	B R/P HD R+	R/P Head right channel positive
○	4	ERASE HEAD	Erase Head
○	5	GND A	Erase Head ground

CONNECTOR 1720 — DECK B HEADS CONNECTON *(For Dolby B NR version only)*

	Pin	Signal	Description
○	1	B R/P HD L+	R/P Head left channel positive
○	2	B R/P HD L-	R/P Head left channel negative
○	3	B R/P HD R+	R/P Head right channel positive
○	4	B R/P HD R-	R/P Head right channel negative
○	5	ERASE HEAD	Erase Head
○	6	GND A	Erase Head ground

CONNECTOR 1730 — DECK A HEAD CONNECTIONS *(For Double Deck versions only)*

	Pin	Signal	Description
○	1	A PB HD L+	Pb Head left channel positive
○	2	GND A	Pb Head return ground shield
○	3	A PB HD R+	Pb Head right channel positive

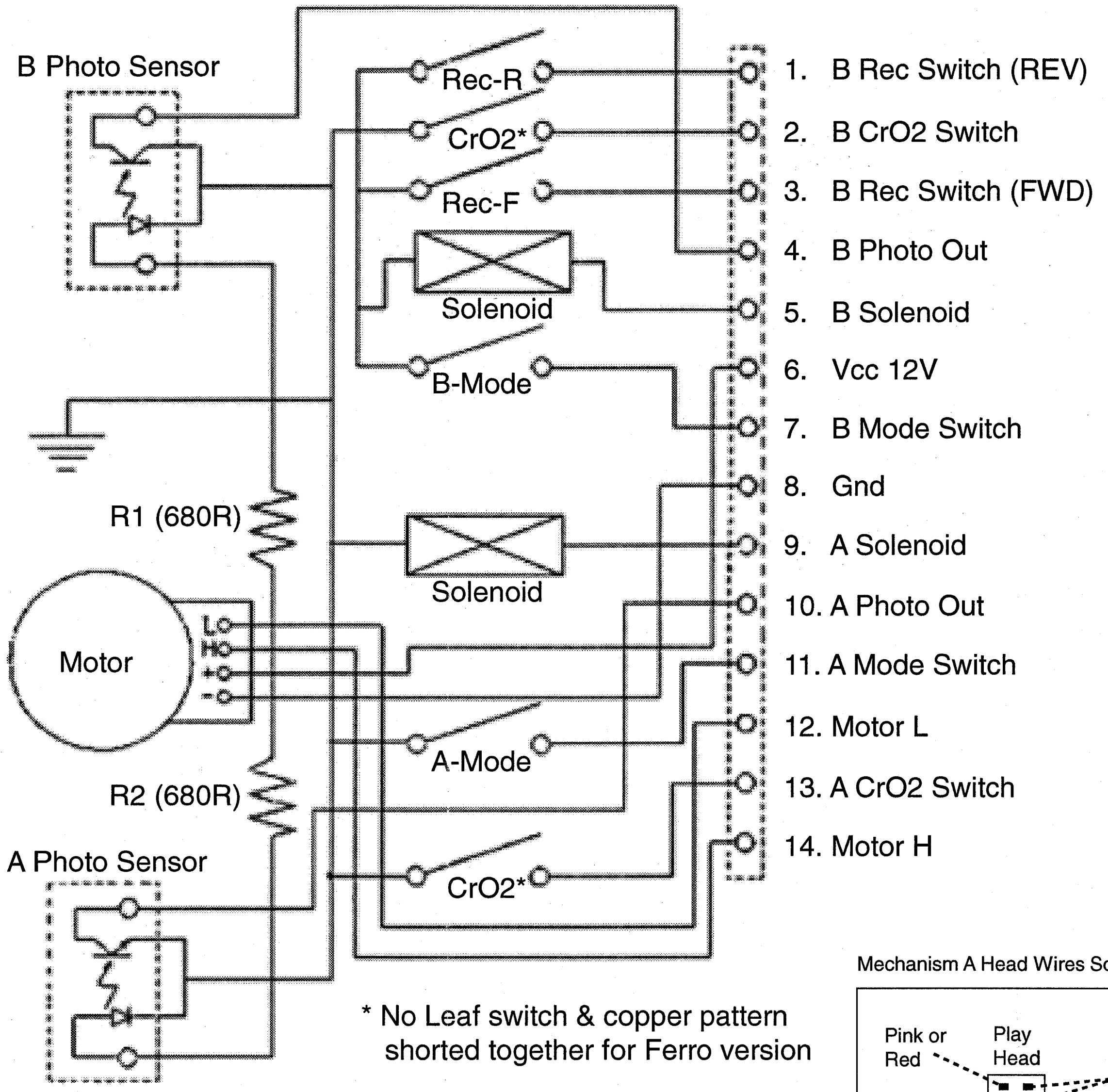
CONNECTOR 1740 — DECK A & B CONTROL INTERFACE *(For Dolby B NR version only)*

	Pin	Signal	Description	
○	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
○	2	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
○	3	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
○	4	PHOTO B	Photo sensor output (tape movement indication)	
○	5	SOL B	Solenoid supply for deck B	
○	6	Vcc	Deck / Motor supply	
○	7	MODE B	Mode switch (head engagement)	[open=off: close=engaged]
○	8	GND M	Deck / Motor ground	
○	9	SOL A	Solenoid supply for deck A	
○	10	PHOTO A	Photo sensor output (tape movement indication)	
○	11	MODE A	Mode switch (head engagement)	[open=off: close=engaged]
○	12	L	L pin for motor	
○	13	CrO2 A	Chrome tape detection switch deck A	[open=Cr: close=Fe]
○	14	H	H pin for motor	

CONNECTOR 1770 — DECK A & B CONTROL INTERFACE *(For Non-Dolby version only)*

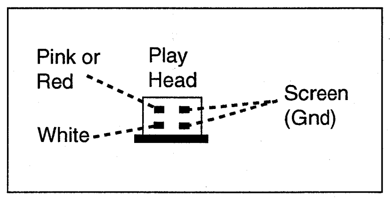
	Pin	Signal	Description	
○	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
○	2	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
○	3	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
○	4	PHOTO B	Photo sensor output (tape movement indication)	
○	5	SOL B	Solenoid supply for deck B	
○	6	Vcc	Deck / Motor supply	
○	7	MODE B	Mode switch (head engagement)	[open=off: close=engaged]
○	8	GND M	Deck / Motor ground	
○	9	SOL A	Solenoid supply for deck A	
○	10	PHOTO A	Photo sensor output (tape movement indication)	
○	11	MODE A	Mode switch (head engagement)	[open=off: close=engaged]
○	12	L	L pin for motor	
○	13	CrO2 A	Chrome tape detection switch deck A	[open=Cr: close=Fe]
○	14	H	H pin for motor	

TAPE MECHANISM ELECTRONICS

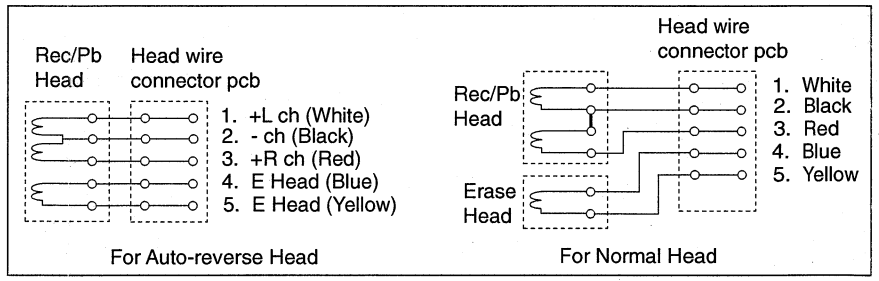

B Photo Sensor
Rec-R
CrO2*
Rec-F
Solenoid
B-Mode
R1 (680R)
Solenoid
Motor
L
H
+
-
A-Mode
R2 (680R)
A Photo Sensor
CrO2*
1. B Rec Switch (REV)
2. B CrO2 Switch
3. B Rec Switch (FWD)
4. B Photo Out
5. B Solenoid
6. Vcc 12V
7. B Mode Switch
8. Gnd
9. A Solenoid
10. A Photo Out
11. A Mode Switch
12. Motor L
13. A CrO2 Switch
14. Motor H

* No Leaf switch & copper pattern shorted together for Ferro version

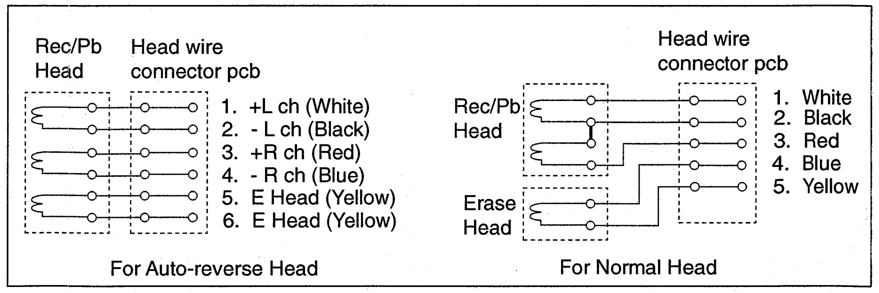
Mechanism A Head Wires Soldering


Pink or Red
White
Play Head
Screen (Gnd)

Mechanism B Head Wires Soldering (Non-Dolby version)


Rec/Pb Head
Head wire connector pcb
1. +L ch (White)
2. - ch (Black)
3. +R ch (Red)
4. E Head (Blue)
5. E Head (Yellow)
For Auto-reverse Head
Rec/Pb Head
Erase Head
Head wire connector pcb
1. White
2. Black
3. Red
4. Blue
5. Yellow
For Normal Head

Mechanism B Head Wires Soldering (Dolby B NR version)


Rec/Pb Head
Head wire connector pcb
1. +L ch (White)
2. - L ch (Black)
3. +R ch (Red)
4. - R ch (Blue)
5. E Head (Yellow)
6. E Head (Yellow)
For Auto-reverse Head
Rec/Pb Head
Erase Head
Head wire connector pcb
1. White
2. Black
3. Red
4. Blue
5. Yellow
For Normal Head

TAPE ADJUSTMENT & CHECK TABLE

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
ADJUST MOTOR SPEED						
NORMAL SPEED	SBC420 3150Hz	PLAY B	◇1 or ◇2 LEFT RIGHT	frequency counter	3620	3150Hz +/- 0.5%
		PLAY A			check	3150Hz -0.8/+1.8%
CHECK WOW & FLUTTER						
DECK A & B	SBC420 3150Hz	PLAY	◇1 or ◇2 LEFT RIGHT	W&F-meter	check	<0.4 % DIN
ADJUST AZIMUTH						
DECK A & B	SBC420 10kHz	PLAY FWD	◇1 or ◇2 LEFT RIGHT	mV-meter	left hand screw	max. output level & left=right
		PLAY REV #			right hand screw	
CHECK PLAYBACK FREQUENCY RESPONSE						
DECK A & B	SBC420	PLAY	◇1 or ◇2 LEFT RIGHT	mV-meter	check	limits see fig.1
ADJUST BIAS CURRENT						
DECK B	SBC419A^	RECORD	◇5 or ◇6 LEFT RIGHT	mV-meter	3773	995mV
	SBC420				check	750mV +/- 1.5dB
CHECK OVERALL FREQUENCY RESPONSE AND DISTORTION						
Inject 3mV signals 100Hz, 250Hz, 1kHz, 10kHz, 12.5kHz via ◇3 or ◇4	SBC419A^ or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	◇1 or ◇2 LEFT RIGHT	mV-meter	check	limits see fig. 2 *
Inject 1kHz 8.85mV via ◇3 or ◇4	SBC419A^ or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	◇1 or ◇2 LEFT RIGHT	THD-meter	check	<3% *

SBC419A^ : 4822 397 30069
SBC420 : 4822 397 30071

# For Auto-reverse version only
* If high frequencies are not within limits, decrease bias and re-measure. If distortion is too high, increase bias and re-meaure
^ Not applicable for Ferro version

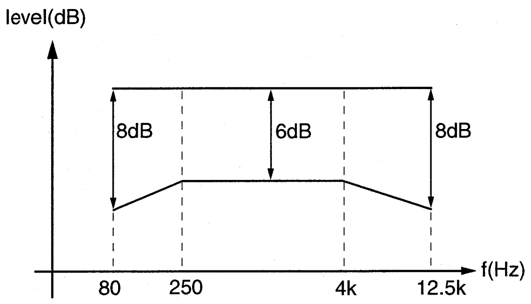


figure. 1

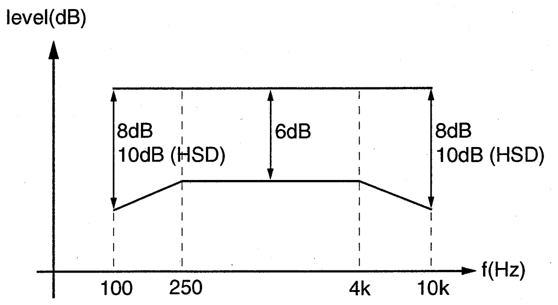
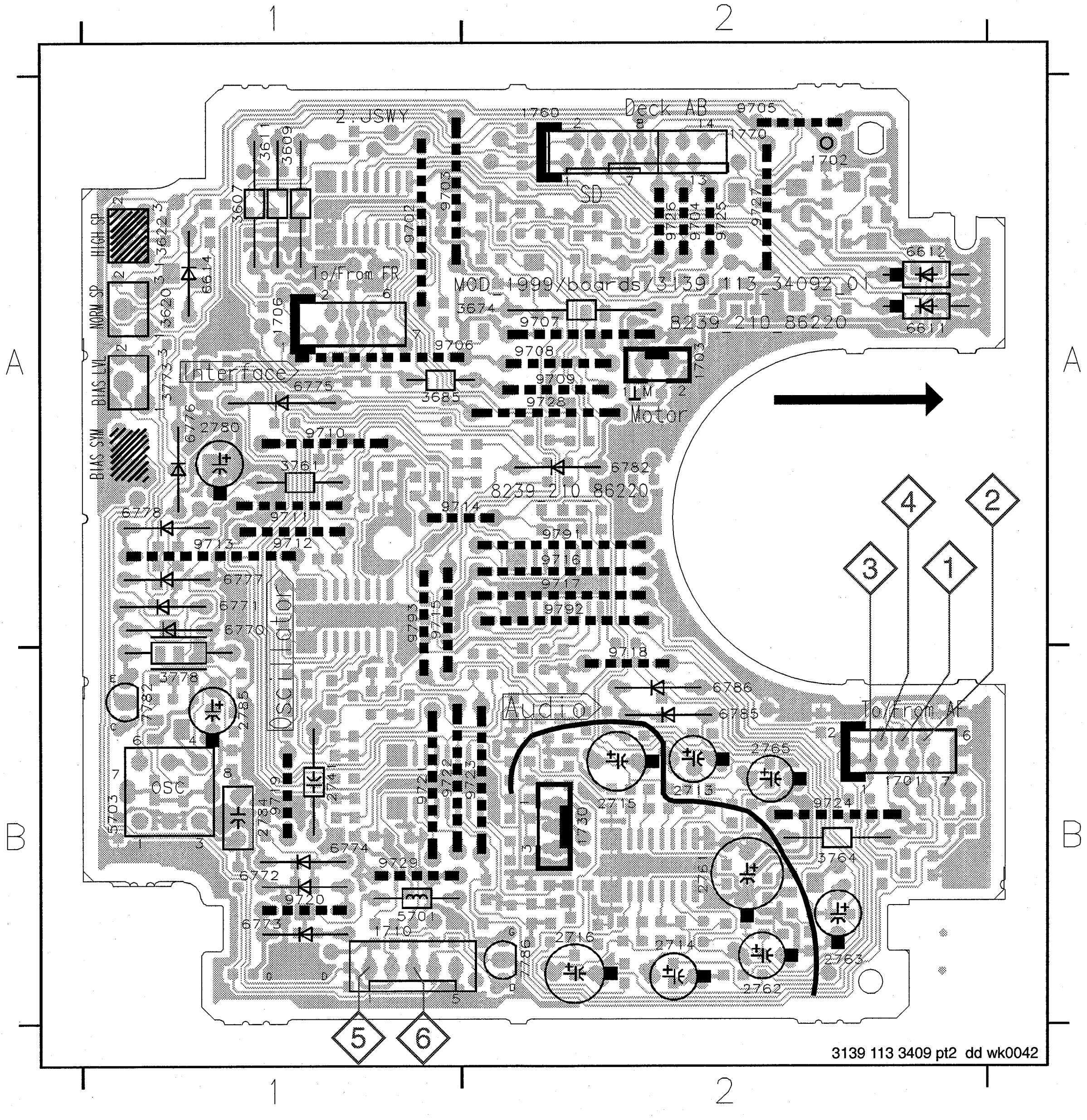


figure. 2

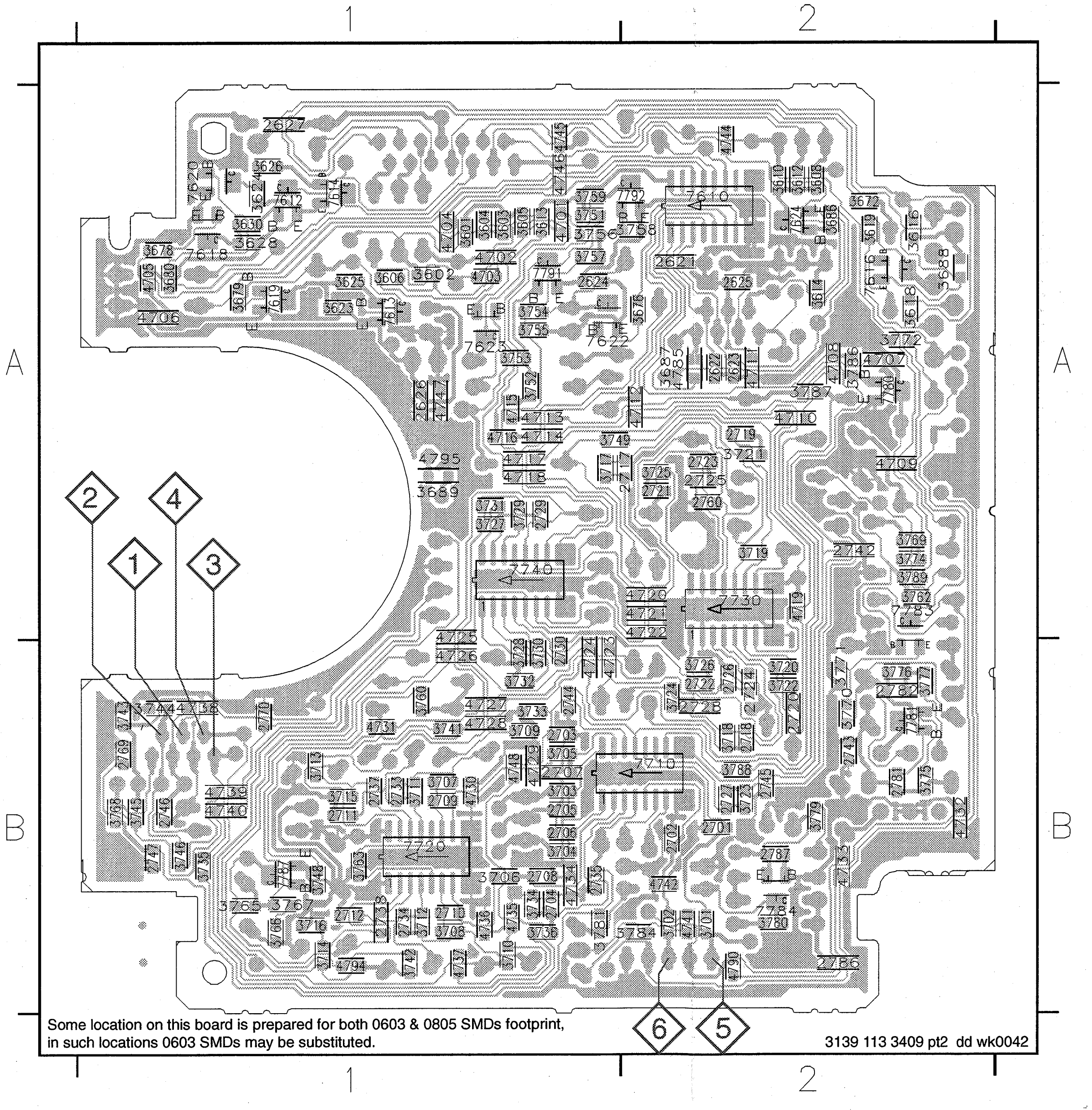
COMPONENT LAYOUT

1701	B2	2714	B2	2784	B1	3761	A1	6770	A1	6782	A2	9706	A1	9715	A1	9724	B2
1702	A2	2715	B2	2785	B1	3764	B2	6771	A1	6785	B2	9707	A2	9716	A2	9725	A2
1703	A2	2716	B2	3607	A1	3773	A1	6772	B1	6786	B2	9708	A2	9717	A2	9726	A2
1706	A1	2741	B1	3609	A1	3778	B1	6773	B1	7782	B1	9709	A2	9718	B2	9727	A2
1710	B1	2761	B2	3611	A1	5701	B1	6774	B1	7786	B2	9710	A1	9719	B1	9728	A2
1730	B2	2762	B2	3620	A1	5703	B1	6775	A1	9702	A1	9711	A1	9720	B1	9729	B1
1760	A2	2763	B2	3622	A1	6611	A2	6776	A1	9703	A1	9712	A1	9721	B1	9791	A2
1770	A2	2765	B2	3674	A2	6612	A2	6777	A1	9704	A2	9713	A1	9722	B1	9792	A2
2713	B2	2780	A1	3685	A1	6614	A1	6778	A1	9705	A2	9714	A1	9723	B2	9793	A1



CHIP LAYOUT

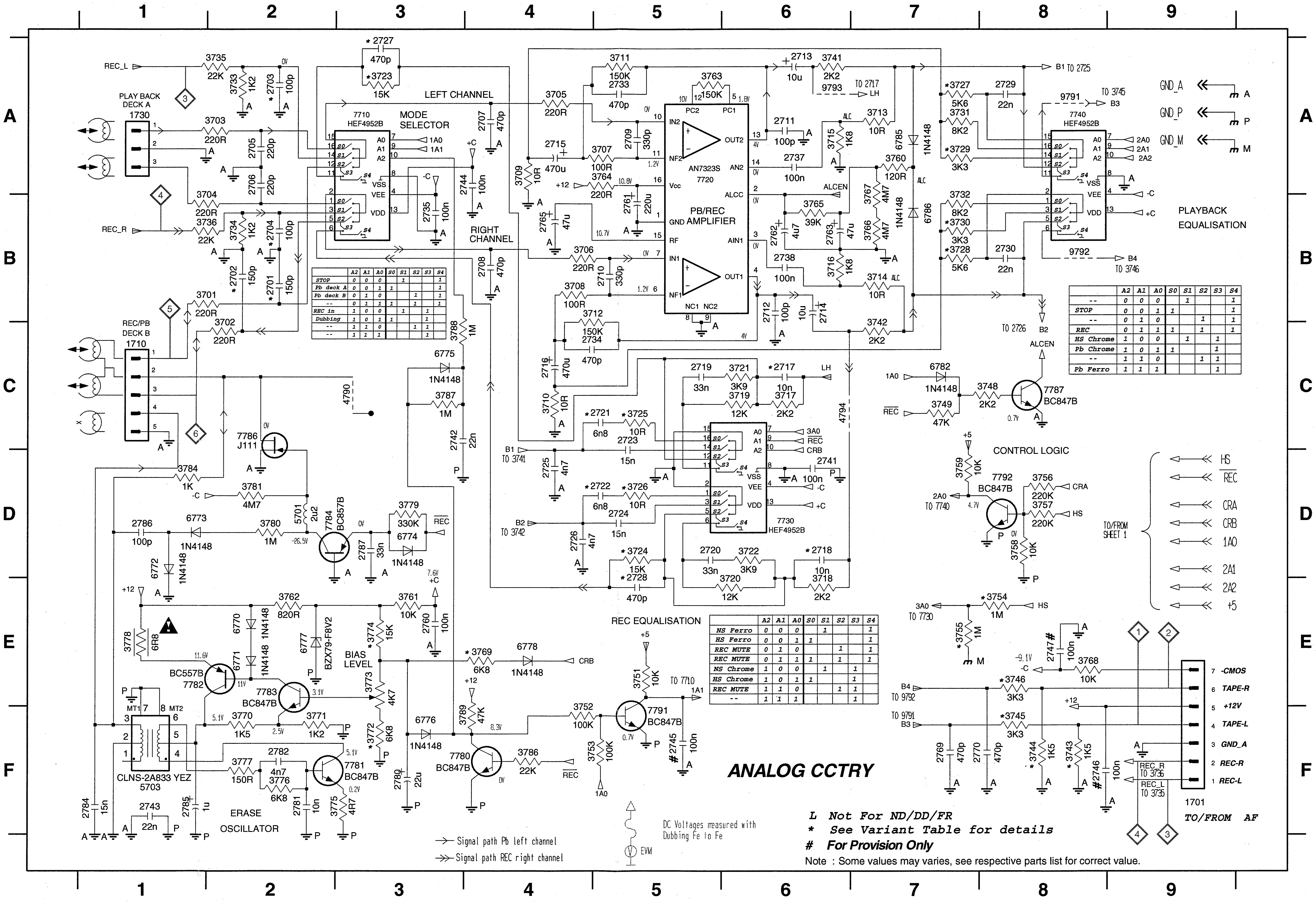
2621	A2	2724	B2	3602	A1	3688	A2	3725	A2	3757	A1	4701	A1	4727	B1	7612	A1
2622	A2	2725	A2	3603	A1	3689	A1	3726	B2	3758	A2	4702	A1	4728	B1	7613	A1
2623	A2	2726	B2	3604	A1	3701	B2	3727	A1	3759	A1	4703	A1	4729	B1	7614	A1
2624	A1	2727	B2	3605	A1	3702	B2	3728	B1	3760	B1	4704	A1	4730	B1	7616	A2
2625	A2	2728	B2	3606	A1	3703	B1	3729	A1	3762	A2	4705	A1	4731	B1	7618	A1
2626	A1	2729	A1	3608	A2	3704	B1	3730	B1	3763	B1	4706	A1	4732	B2	7619	A1
2627	A1	2730	B1	3610	A2	3705	B1	3731	A1	3765	B1	4707	A2	4733	B2	7620	A1
2701	B2	2733	B1	3612	A2	3706	B1	3732	B1	3766	B1	4708	A2	4734	B1	7622	A1
2702	B2	2734	B1	3613	A1	3707	B1	3733	B1	3767	B1	4709	A2	4735	B1	7623	A1
2703	B1	2735	B1	3614	A2	3708	B1	3734	B1	3768	B1	4710	A2	4736	B1	7624	A2
2704	B1	2737	B1	3616	A2	3709	B1	3735	B1	3769	A2	4711	A2	4737	B1	7710	B2
2705	B1	2738	B1	3618	A2	3710	B1	3736	B1	3770	B2	4712	A2	4738	B1	7720	B1
2706	B1	2742	A2	3619	A2	3711	B1	3741	B1	3771	B2	4713	A1	4739	B1	7730	A2
2707	B1	2743	B2	3623	A1	3712	B1	3742	B1	3772	A2	4714	A1	4740	B1	7740	A1
2708	B1	2744	B1	3624	A1	3713	B1	3743	B1	3774	A2	4715	A1	4741	B2	7780	A2
2709	B1	2745	B2	3625	A1	3714	B1	3744	B1	3775	B2	4716	A1	4742	B2	7781	B2
2710	B1	2746	B1	3626	A1	3715	B1	3745	B1	3776	B2	4717	A1	4744	A2	7783	A2
2711	B1	2747	B1	3628	A1	3716	B1	3746	B1	3777	B2	4718	A1	4745	A1	7784	B2
2712	B1	2760	A2	3630	A1	3717	A1	3748	B1	3779	B2	4719	A2	4746	A1	7787	B1
2717	A2	2769	B1	3672	A2	3718	B2	3749	A1	3780	B2	4720	A2	4747	A1	7791	A1
2718	B2	2770	B1	3676	A2	3719	A2	3751	A1	3781	B1	4721	A2	4748	B1	7792	A2
2719	A2	2781	B2	3678	A1	3720	B2	3752	A1	3784	B2	4722	A2	4785	A2		
2720	B2	2782	B2	3679	A1	3721	A2	3753	A1	3786	A2	4723	B1	4790	B2		
2721	A2	2786	B2	3680	A1	3722	B2	3754	A1	3787	A2	4724	B1	4794	B1		
2722	B2	2787	B2	3686	A2	3723	B2	3755	A1	3788	B2	4725	A1	4795	A1		
2723	A2	3601	A1	3687	A2	3724	B2	3756	A1	3789	A2	4726	B1	7610	A2		



Some location on this board is prepared for both 0603 & 0805 SMDs footprint, in such locations 0603 SMDs may be substituted.

ANALOG CIRCUIT

1701 F9	2705 A2	2712 B6	2719 C5	2726 D4	2735 B3	2745 F5	2765 B4	2785 F1	3705 A4	3712 B4	3719 C6	3726 D5	3733 A2	3744 F8	3753 F5	3760 A7	3767 A7	3774 E3	3781 D2	4794 C6	6774 D3	6786 B7	7782 E1	9791 A8
1710 C1	2706 A2	2713 A6	2720 D5	2727 A3	2737 A6	2746 F8	2769 F7	2786 D1	3706 B4	3713 A7	3720 E6	3727 A7	3734 B2	3745 F8	3754 E8	3761 E3	3768 E8	3775 F3	3784 D1	5701 D2	6775 C3	7710 A3	7783 E2	9792 B8
1730 A1	2707 A4	2714 B6	2721 C5	2728 E5	2738 B6	2747 E8	2770 F8	2787 D3	3707 A5	3714 B7	3721 C6	3728 B7	3735 A2	3746 E8	3755 E7	3762 E2	3769 E4	3776 F2	3786 F4	5703 F1	6776 F3	7720 A5	7784 D2	9793 A6
2701 B2	2708 B4	2715 A4	2722 D5	2729 A8	2741 D6	2760 E3	2780 F3	3701 B1	3708 B4	3715 A6	3722 D6	3729 A7	3736 B1	3748 C8	3756 D8	3763 A5	3770 F2	3777 F2	3787 C3	6770 E2	6777 E2	7730 D6	7786 C2	
2702 B2	2709 A5	2716 C4	2723 C5	2730 B8	2742 C3	2761 B5	2781 F2	3702 C2	3709 A4	3716 B6	3723 A3	3730 B7	3741 A6	3749 C7	3757 D8	3764 A5	3771 F2	3778 E1	3788 C3	6771 E2	6778 E4	7740 A8	7787 C8	
2703 A2	2710 B5	2717 C6	2724 D5	2733 A5	2743 F1	2762 B6	2782 F2	3703 A2	3710 C4	3717 C6	3724 D5	3731 A7	3742 C7	3751 E5	3758 D8	3765 B6	3772 F3	3779 D3	3789 F4	6772 D1	6782 C7	7780 F4	7791 F5	
2704 B2	2711 A6	2718 D6	2725 D4	2734 C4	2744 A4	2763 B6	2784 F1	3704 B1	3711 A5	3718 E6	3725 C5	3732 B7	3743 F8	3752 F4	3759 D7	3766 B7	3773 E3	3780 D2	4790 C3	6773 D1	6785 A7	7781 F3	7792 D8	


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
REC_L
REC_R
PLAY BACK DECK A
1730
REC/PB DECK B
1710
LEFT CHANNEL
RIGHT CHANNEL
MODE SELECTOR
7710 HEF4952B
PB/REC AMPLIFIER
AN7323S 7720
7740 HEF4952B
PLAYBACK EQUALISATION
7730 HEF4952B
REC EQUALISATION
CONTROL LOGIC
ERASE OSCILLATOR
BIAS LEVEL
CLNS-2A833 YEZ 5703
7786 J111
7784 BC857B
7782 BC557B
7783 BC847B
7781 BC847B
7780 BC847B
7791 BC847B
7787 BC847B
7792 BC847B
BZX79-F8V2
1N4148
ALCEN
GND_A
GND_P
GND_M
TO/FROM SHEET 1
HS
REC
CRA
CRB
1A0
2A1
2A2
+5
1701 TO/FROM AF
7 -CMOS
6 TAPE-R
5 +12V
4 TAPE-L
3 GND_A
2 REC-R
1 REC-L
ANALOG CCTRY
Signal path Pb left channel
Signal path REC right channel
DC Voltages measured with Dubbing Fe to Fe
EVM

	A2	A1	A0	S0	S1	S2	S3	S4
STOP	0	0	0		1			1
Pb deck A	0	0	1	1				1
Pb deck B	0	1	0			1		1
--	0	1	1	1		1		1
REC in	1	0	0		1		1	
Dubbing	1	0	1	1			1	
--	1	1	0			1	1	
--	1	1	1				1	

	A2	A1	A0	S0	S1	S2	S3	S4
--	0	0	0		1			1
STOP	0	0	1	1				1
--	0	1	0			1		1
REC	0	1	1	1		1		1
HS Chrome	1	0	0		1		1	
Pb Chrome	1	0	1	1			1	
--	1	1	0			1	1	
Pb Ferro	1	1	1				1	

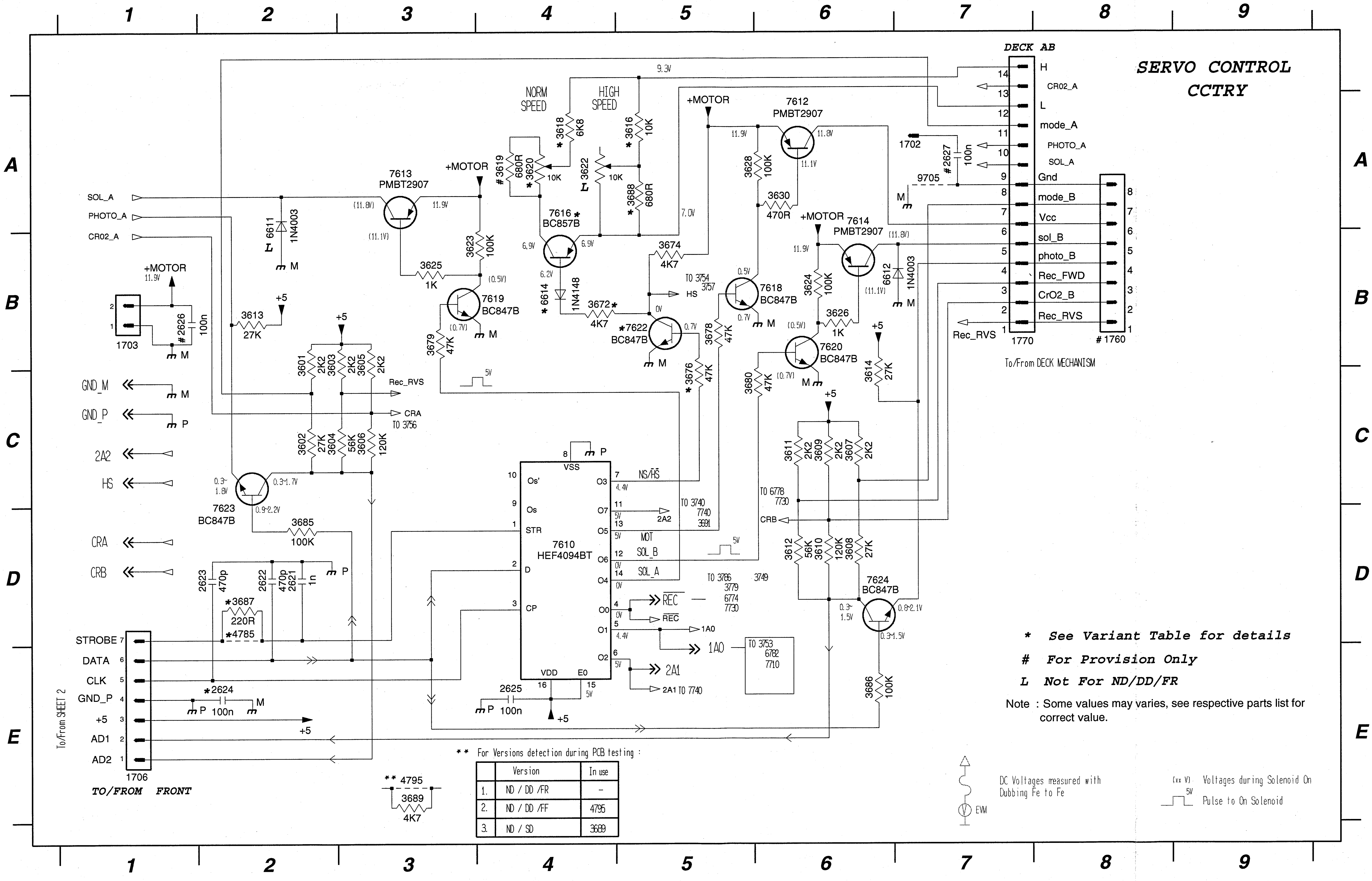
	A2	A1	A0	S0	S1	S2	S3	S4
NS Ferro	0	0	0		1			1
HS Ferro	0	0	1	1				1
REC MUTE	0	1	0			1		1
REC MUTE	0	1	1	1		1		1
NS Chrome	1	0	0		1		1	
HS Chrome	1	0	1	1			1	
REC MUTE	1	1	0			1	1	
--	1	1	1				1	

L Not For ND/DD/FR
** See Variant Table for details*
# For Provision Only

Note : Some values may varies, see respective parts list for correct value.

SERVO CONTROL CIRCUIT

1702	A7
1703	B1
1706	E1
1760	B8
1770	B7
2621	D2
2622	D2
2623	D2
2624	E2
2625	E4
2626	B1
2627	A7
3601	B2
3602	C2
3603	B2
3604	C2
3605	B3
3606	C3
3607	C6
3608	D6
3609	C6
3610	D6
3611	C6
3612	D6
3613	B2
3614	C6
3616	A5
3618	A4
3619	A4
3620	A4
3622	A4
3623	B3
3624	B6
3625	B3
3626	B6
3628	A5
3630	A6
3672	B4
3674	B5
3676	C5
3678	B5
3679	B3
3680	C5
3685	D2
3686	E6
3687	D2
3688	A5
3689	E3
4785	D2
4795	E3
6611	A2
6612	B6
6614	B4
7610	D4
7612	A6
7613	A3
7614	A6
7616	A4
7618	B6
7619	B4
7620	B6
7622	B5
7623	D2
7624	D6
9705	A7


SERVO CONTROL CCTRY
DECK AB
H
CR02_A
L
mode_A
PHOTO_A
SOL_A
Gnd
mode_B
Vcc
sol_B
photo_B
Rec_FWD
CrO2_B
Rec_RVS
1770
#1760
To/From DECK MECHANISM
1702
#2627 100n
9705
SOL_A
PHOTO_A
CR02_A
+MOTOR
1703
#2626 100n
GND_M
GND_P
2A2
HS
CRA
CRB
STROBE
DATA
CLK
GND_P
+5
AD1
AD2
1706
To/From SHEET 2
TO/FROM FRONT
7613 PMBT2907
7612 PMBT2907
7614 PMBT2907
7616 BC857B
7619 BC847B
7618 BC847B
7620 BC847B
7622 BC847B
7623 BC847B
7624 BC847B
7610 HEF4094BT
NORM SPEED
HIGH SPEED
9.3V
6611 1N4003
6612 1N4003
6614 1N4148
3613 27K
3625 1K
3623 100K
3679 47K
3618 6K8
3619 680R
3620 10K
3622 10K
3616 10K
3688 680R
3628 100K
3630 470R
3674 4K7
3672 4K7
3678 47K
3676 47K
3680 47K
3624 100K
3626 1K
3614 27K
3601 2K2
3603 2K2
3605 2K2
3602 27K
3604 56K
3606 120K
3685 100K
3611 2K2
3609 2K2
3607 2K2
3612 56K
3610 120K
3608 27K
3686 100K
2623 470p
2622 470p
2621 1n
3687 220R
4785
2624
100n
2625 100n
Rec_RVS
CRA
TO 3756
HS
TO 3754 3757
NS/HS
2A2
MOT
SOL_B
SOL_A
REC
REC
1A0
1A0
2A1
2A1 TO 7740
TO 3740 7740 3691
TO 3786 3779 6774 7730 3749
TO 3753 6782 7710
TO 6778 7730
CRB
** 4795
3689 4K7

** For Versions detection during PCB testing :

	Version	In use
1.	ND / DD /FR	–
2.	ND / DD /FF	4795
3.	ND / SD	3689

* See Variant Table for details

# For Provision Only

L Not For ND/DD/FR

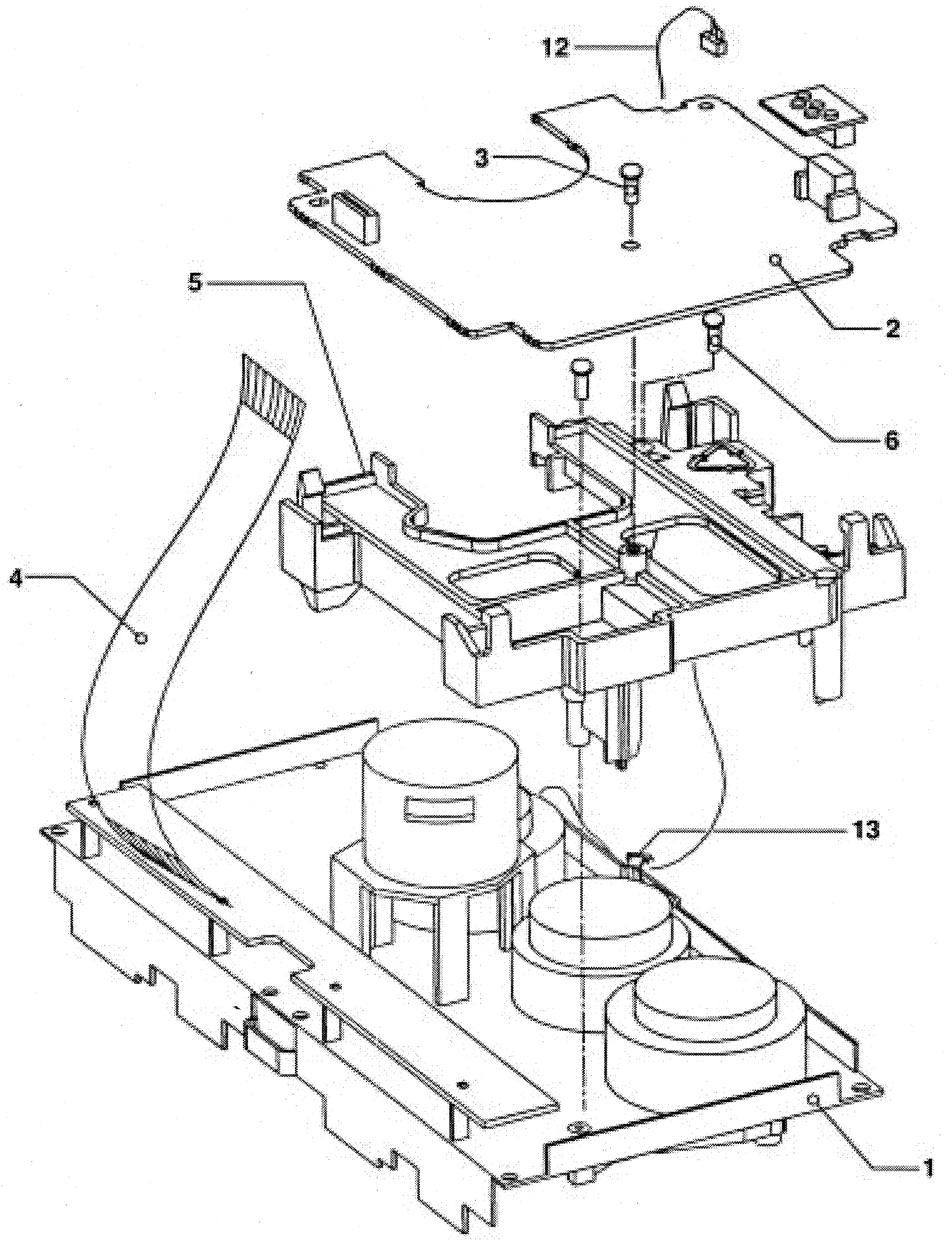
Note : Some values may varies, see respective parts list for correct value.

DC Voltages measured with Dubbing Fe to Fe

EVM

(xx V) Voltages during Solenoid On

5V Pulse to On Solenoid

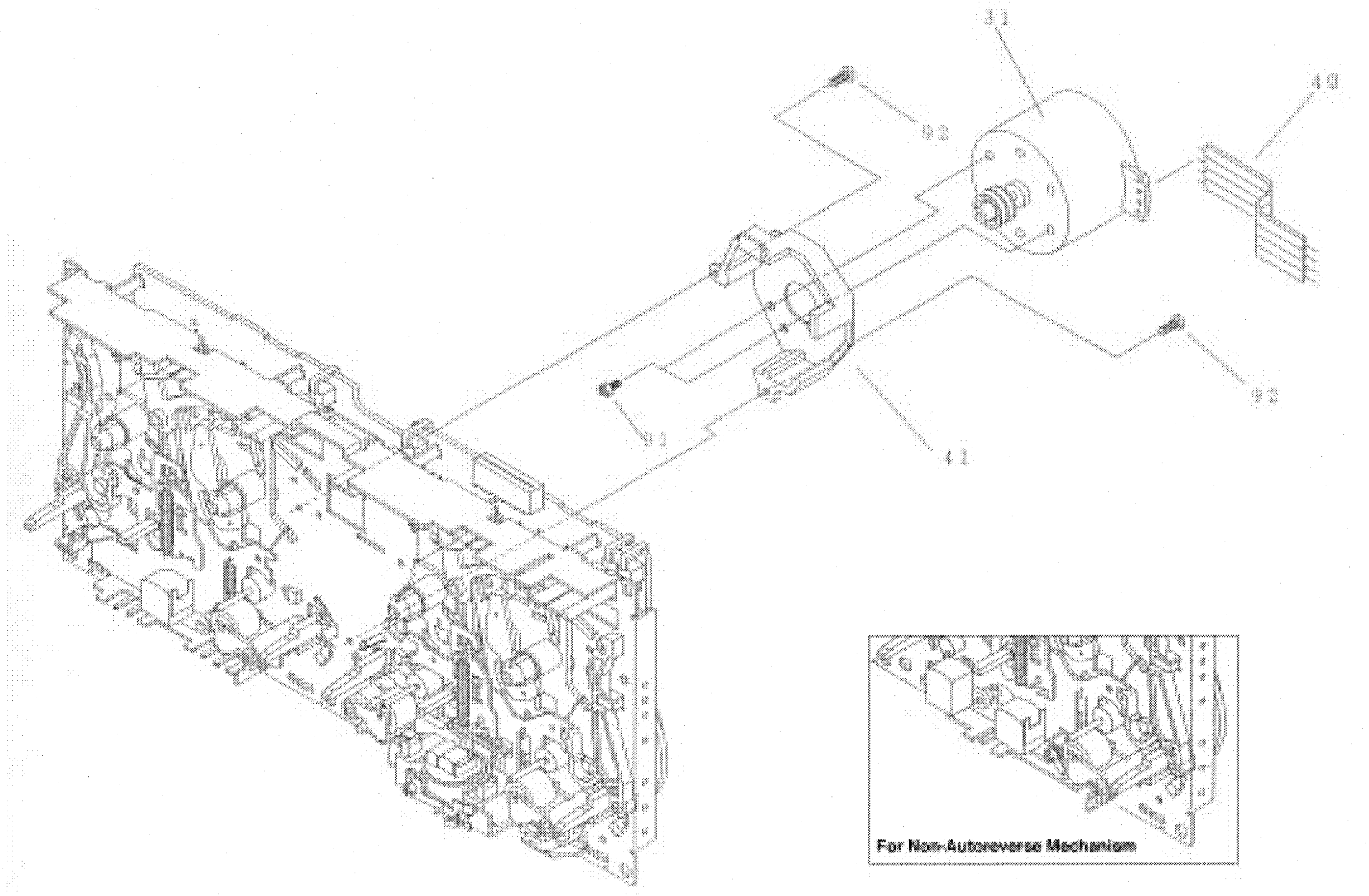


3139 118 77070 (incl. ...77080) dd wk926

TAPE MODULE EXPLODED VIEW

1	3139 118 77130	Autoreverse Mech. CWE44FR01
1	3139 118 77140	Non-Autoreverse Mech. CWE44FF02 Chrome/Ferro
1	3139 118 77950	Non-Autoreverse Mech. CWE44FF05 Ferro
3	-	Screw D3 x 10
6	-	Screw M2 x 16
7	3139 110 34080	Flex Cable 14 pin 7,5 cm

Note: Only the parts mentioned in this list are normal service spare parts.



For Non-Autoreverse Mechanism

TAPE MECHANISM - MOTOR EXPLODED VIEW

31	4822 361 11055	Motor Assembly
91	-	Screw M2,6 x 5
92	-	Screw M2 x 5

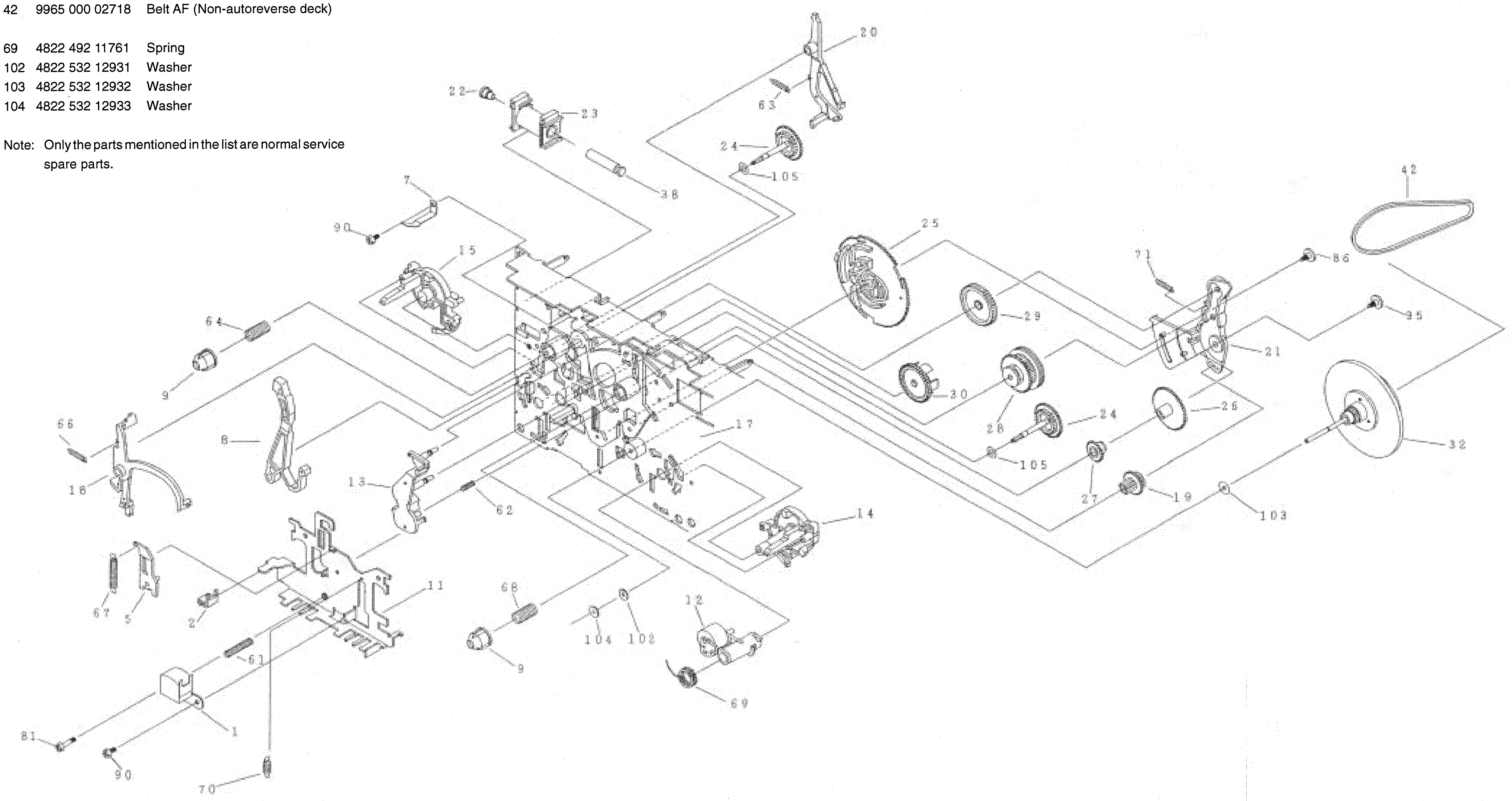
Note: Only the parts mentioned in this list are normal service spare parts.

TAPE MECHANISM A - PLAY

MECHANICAL PARTS - PLAY MECHANISM

1	9965 000 02313	Play Head (Non-Autoreverse deck)
1	9965 000 02321	Play Head (Autoreverse deck)
12	4822 402 10972	Pinch Arm Assembly R
23	9965 000 02314	Coil Assembly
25	9965 000 06443	Cam Gear
32	4822 528 11209	Flywheel Assembly RV
42	9965 000 02315	Belt AF (Autoreverse deck)
42	9965 000 02718	Belt AF (Non-autoreverse deck)
69	4822 492 11761	Spring
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer

Note: Only the parts mentioned in the list are normal service spare parts.


20
22
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105
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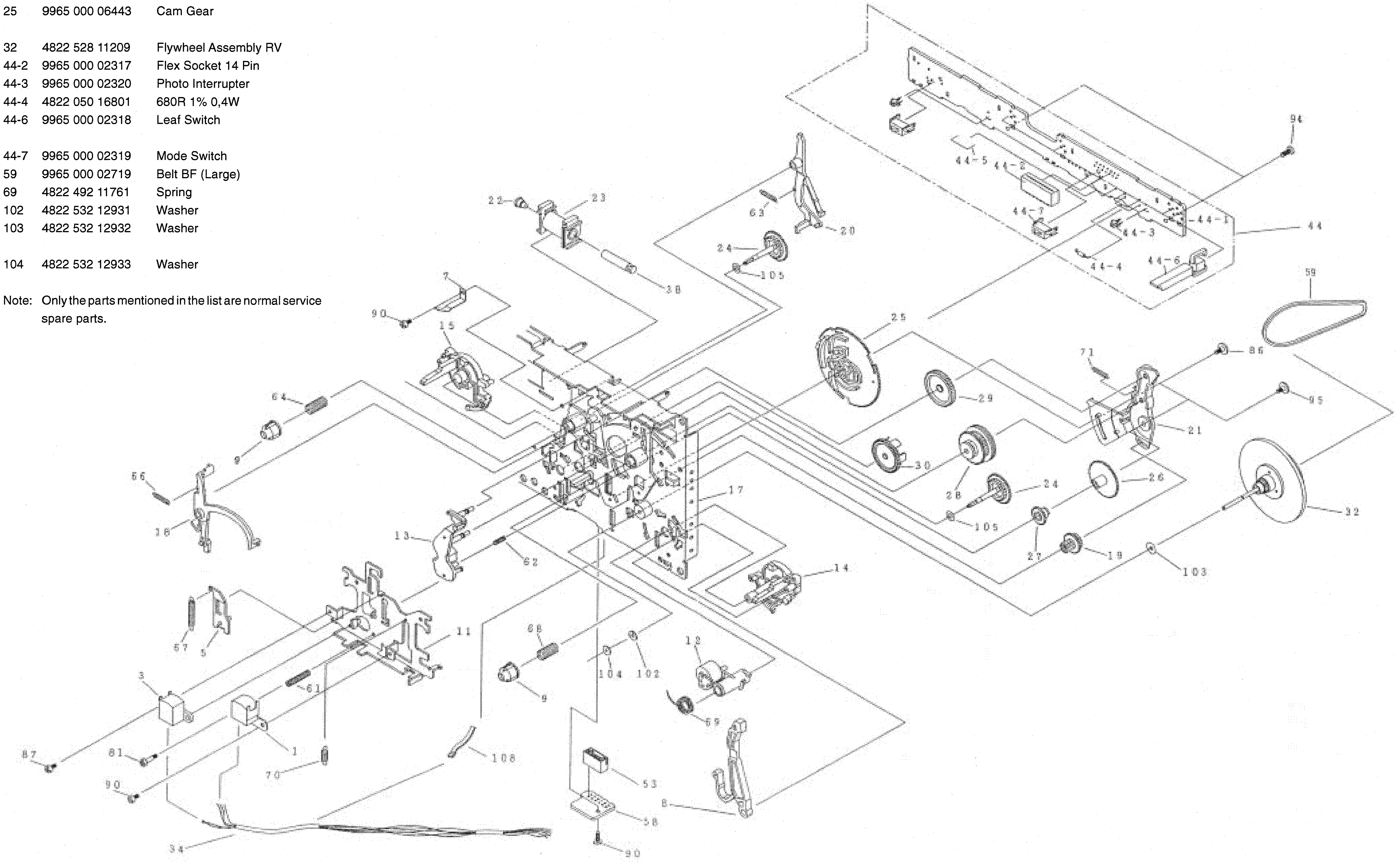
25
15
71
86
35
64
29
21
9
30
66
8
28
24
26
17
32
105
16
13
62
14
27
19
103
11
68
12
67
5
2
104
102
61
9
69
1
81
90
70

TAPE MECHANISM B - RECORD/PLAYBACK *(Non-Autoreverse version)*

MECHANICAL PARTS - REC/PB MECHANISM

1	9965 000 02313	Play Head
3	9965 000 02600	Head, Erase
12	4822 402 10972	Pinch Arm Assembly R
23	9965 000 02314	Coil Assembly
25	9965 000 06443	Cam Gear
32	4822 528 11209	Flywheel Assembly RV
44-2	9965 000 02317	Flex Socket 14 Pin
44-3	9965 000 02320	Photo Interrupter
44-4	4822 050 16801	680R 1% 0,4W
44-6	9965 000 02318	Leaf Switch
44-7	9965 000 02319	Mode Switch
59	9965 000 02719	Belt BF (Large)
69	4822 492 11761	Spring
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer

Note: Only the parts mentioned in the list are normal service spare parts.


94
44-5
44-2
44-7
44-1
44-3
44-4
44-6
44
59
22
23
63
20
24
105
38
7
90
15
25
71
86
95
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27
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103
17
64
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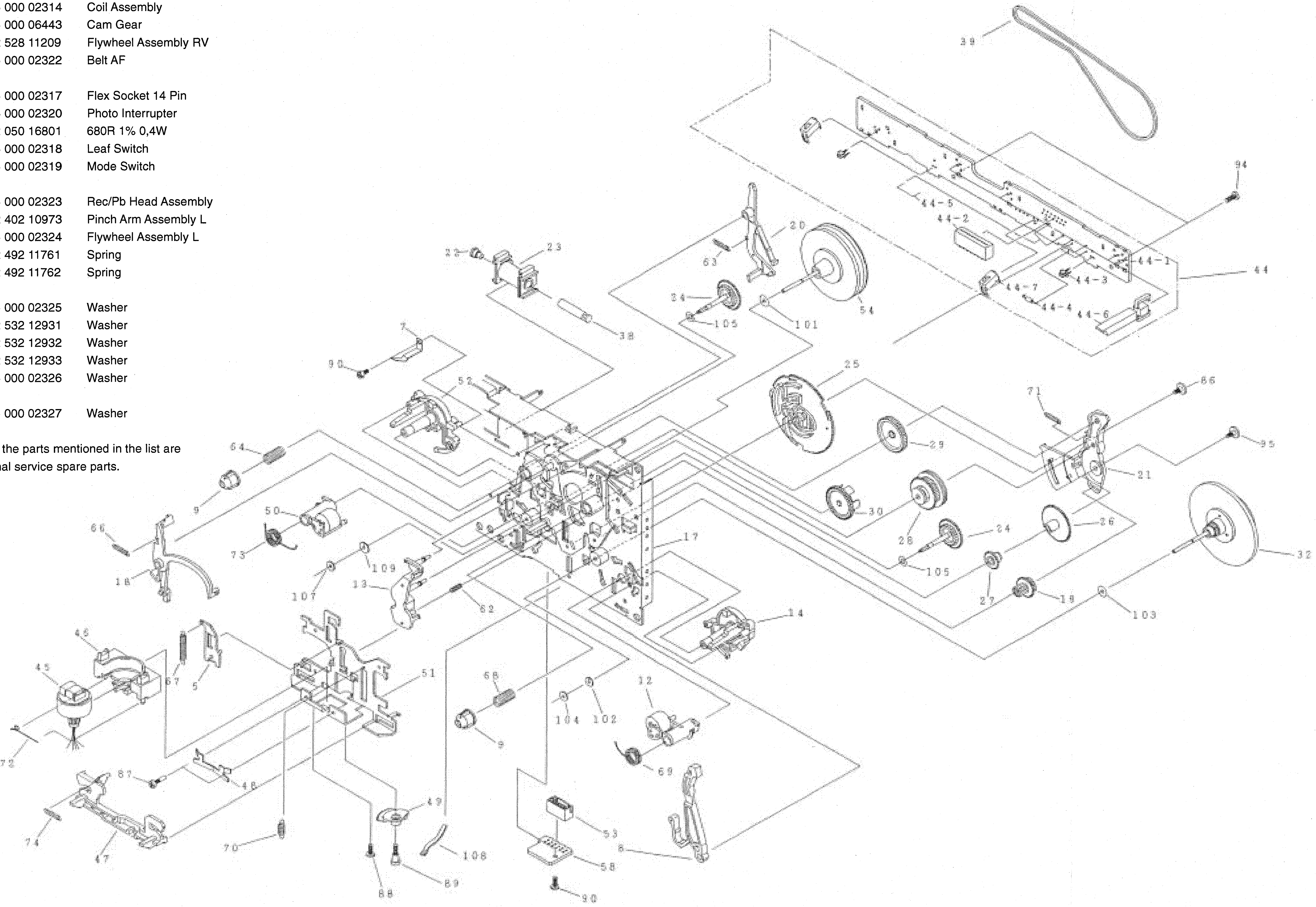
56
16
13
62
14
11
68
104
102
12
9
69
57
5
3
61
1
87
81
90
70
108
53
58
8
90
34

TAPE MECHANISM B - RECORD/PLAYBACK *(Autoreverse version)*

MECHANICAL PARTS - REC/PB MECHANISM

12	4822 402 10972	Pinch Arm Assembly R
23	9965 000 02314	Coil Assembly
25	9965 000 06443	Cam Gear
32	4822 528 11209	Flywheel Assembly RV
39	9965 000 02322	Belt AF
44-2	9965 000 02317	Flex Socket 14 Pin
44-3	9965 000 02320	Photo Interrupter
44-4	4822 050 16801	680R 1% 0,4W
44-6	9965 000 02318	Leaf Switch
44-7	9965 000 02319	Mode Switch
45	9965 000 02323	Rec/Pb Head Assembly
50	4822 402 10973	Pinch Arm Assembly L
54	9965 000 02324	Flywheel Assembly L
69	4822 492 11761	Spring
73	4822 492 11762	Spring
101	9965 000 02325	Washer
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer
107	9965 000 02326	Washer
109	9965 000 02327	Washer

Note: Only the parts mentioned in the list are normal service spare parts.


39
94
44-5
44-2
44-1
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44-3
44-7
44-4
44-6
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63
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101
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23
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71
86
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109
107
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105
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45
67
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89
90

ELECTRICAL PARTS LIST - ETF7 NON-DOLBY BOARD

MISCELLANEOUS

1701	482226710953	Flex Socket 7pin Vert.	
1706	482226710953	Flex Socket 7pin Vert.	
1770	482226751255	Flex Socket 14pin Vert.	

CAPACITORS

2621	532212231647	1nF 10% 63V	
2622	532212234099	470pF 10% 63V	
2623	532212234099	470pF 10% 63V	
2624	482212614585	100nF 10% 50V	only for Ferro
2625	482212614585	100nF 10% 50V	
2701	532212233538	150pF 2% 63V	Autoreverse
2701	482212233216	270pF 5% 63V	Non-autoreverse
2702	532212233538	150pF 2% 63V	Autoreverse
2702	482212233216	270pF 5% 63V	Non-autoreverse
2703	532212232531	100pF 5% 50V	Autoreverse
2703	482212233575	220pF 5% 63V	Non-autoreverse
2704	532212232531	100pF 5% 50V	Autoreverse
2704	482212233575	220pF 5% 63V	Non-autoreverse
2705	482212233575	220pF 5% 63V	
2706	482212233575	220pF 5% 63V	
2707	532212234099	470pF 10% 63V	
2708	532212234099	470pF 10% 63V	
2709	532212231863	330pF 5% 63V	
2710	532212231863	330pF 5% 63V	
2711	532212232531	100pF 5% 50V	
2712	532212232531	100pF 5% 50V	
2713	482212440248	10µF 20% 63V	
2714	482212440248	10µF 20% 63V	
2715	482212480195	470µF 20% 10V	
2716	482212480195	470µF 20% 10V	
2717	482212233177	10nF 20% 50V	Autoreverse
2717	482212613188	15nF 5% 63V	Non-autoreverse
2718	482212233177	10nF 20% 50V	Autoreverse
2718	482212613188	15nF 5% 63V	Non-autoreverse
2719	482212612105	33nF 5% 50V	
2720	482212612105	33nF 5% 50V	
2721	532212231866	6,8nF 10% 63V	not for Ferro
2722	532212231866	6,8nF 10% 63V	not for Ferro
2723	482212613188	15nF 5% 63V	
2724	482212613188	15nF 5% 63V	
2725	532212610223	4,7nF 10% 63V	
2726	532212610223	4,7nF 10% 63V	
2727	532212234099	470pF 10% 63V	Autoreverse
2727	532212231647	1nF 10% 63V	Non-autoreverse
2728	532212234099	470pF 10% 63V	Autoreverse
2728	532212231647	1nF 10% 63V	Non-autoreverse
2729	532212232654	22nF 10% 63V	
2730	532212232654	22nF 10% 63V	
2733	532212234099	470pF 10% 63V	
2734	532212234099	470pF 10% 63V	
2735	482212614585	100nF 10% 50V	
2737	482212614585	100nF 10% 50V	
2738	482212614585	100nF 10% 50V	
2741	482212611585	22nF +80/-20% 25V	
2742	532212232654	22nF 10% 63V	
2743	532212232654	22nF 10% 63V	
2744	482212614585	100nF 10% 50V	
2760	482212614585	100nF 10% 50V	
2761	482212480144	220µF 20% 25V	
2762	482212440769	4,7µF 20% 100V	
2763	482212440433	47µF 20% 25V	
2765	482212440433	47µF 20% 25V	
2769	532212234099	470pF 10% 63V	
2770	532212234099	470pF 10% 63V	
2780	482212481151	22µF 20% 50V	
2781	482212233177	10nF 20% 50V	
2782	532212610223	4,7nF 10% 63V	
2784	482212151305	15nF 10% 50V	
2785	482212421913	1µF 20% 63V	
2786	532212232531	100pF 5% 50V	
2787	482212612105	33nF 5% 50V	

RESISTORS

3601	482211711449	2k2 1% 0,1W	
3602	482205120273	27k 5% 0,1W	
3603	482211711449	2k2 1% 0,1W	
3604	482211711148	56k 1% 0,1W	
3605	482211711449	2k2 1% 0,1W	
3606	482205120124	120k 5% 0,1W	
3607	482211652256	2k2 5% 0,5W	
3608	482205120273	27k 5% 0,1W	
3609	482211652256	2k2 5% 0,5W	
3610	482205120124	120k 5% 0,1W	
3611	482211652256	2k2 5% 0,5W	
3612	482211711148	56k 1% 0,1W	
3613	482205120273	27k 5% 0,1W	
3614	482205120273	27k 5% 0,1W	
3616	482211710833	10k 1% 0,1W	Autoreverse
3616	482205110102	1k 2% 0,25W	Non-autoreverse
3618	482211711507	6k8 1% 0,1W	Autoreverse
3620	482210011141	Trim. 10k 30%	Autoreverse
3622	482210011141	Trim. 10k 30%	Non-autoreverse
3623	482211710837	100k 1% 0,1W	
3624	482211710837	100k 1% 0,1W	
3625	482205110102	1k 2% 0,25W	
3626	482205110102	1k 2% 0,25W	
3628	482211710837	100k 1% 0,1W	
3630	482205120471	470R 5% 0,1W	
3672	482205120472	4k7 5% 0,1W	Autoreverse
3674	482211652283	4k7 5% 0,5W	
3676	482211710834	47k 1% 0,1W	Autoreverse
3678	482211710834	47k 1% 0,1W	
3679	482211710834	47k 1% 0,1W	
3680	482211710834	47k 1% 0,1W	

3685	482211652234	100k 5% 0,5W	
3686	482211710837	100k 1% 0,1W	
3687	482211711503	220R 1% 0,1W	not for Ferro
3688	482211710361	680R 1% 0,1W	Autoreverse
3701	482211711503	220R 1% 0,1W	
3702	482211711503	220R 1% 0,1W	
3703	482211711503	220R 1% 0,1W	
3704	482211711503	220R 1% 0,1W	
3705	482211711503	220R 1% 0,1W	
3706	482211711503	220R 1% 0,1W	
3707	482205120101	100R 5% 0,1W	
3708	482205120101	100R 5% 0,1W	
3709	482205120109	10R 5% 0,1W	
3710	482205120109	10R 5% 0,1W	
3711	482205120154	150k 5% 0,1W	
3712	482205120154	150k 5% 0,1W	
3713	482205120109	10R 5% 0,1W	
3714	482205120109	10R 5% 0,1W	
3715	482205120182	1k8 5% 0,1W	
3716	482205120182	1k8 5% 0,1W	
3717	482211711449	2k2 1% 0,1W	
3718	482211711449	2k2 1% 0,1W	
3719	482211711383	12k 1% 0,1W	
3720	482211711383	12k 1% 0,1W	
3721	482205120392	3k9 5% 0,1W	
3722	482205120392	3k9 5% 0,1W	
3723	482211683933	15k 1% 0,1W	Autoreverse
3723	482211710965	18k 1% 0,1W	Non-autoreverse
3724	482211683933	15k 1% 0,1W	Autoreverse
3724	482211710965	18k 1% 0,1W	Non-autoreverse
3725	482205120109	10R 5% 0,1W	not for Ferro
3726	482205120109	10R 5% 0,1W	not for Ferro
3727	482205120562	5k6 5% 0,1W	Autoreverse
3727	482211711507	6k8 1% 0,1W	Non-autoreverse
3728	482205120562	5k6 5% 0,1W	Autoreverse
3728	482211711507	6k8 1% 0,1W	Non-autoreverse
3729	482205120332	3k3 5% 0,1W	Autoreverse
3729	482205120472	4k7 5% 0,1W	Non-autoreverse
3730	482205120332	3k3 5% 0,1W	Autoreverse
3730	482205120472	4k7 5% 0,1W	Non-autoreverse
3731	482205120822	8k2 5% 0,1W	
3732	482205120822	8k2 5% 0,1W	
3733	482205120122	1k2 5% 0,1W	
3734	482205120122	1k2 5% 0,1W	
3735	482205120223	22k 5% 0,1W	
3736	482205120223	22k 5% 0,1W	
3741	482211711449	2k2 1% 0,1W	
3742	482211711449	2k2 1% 0,1W	
3743	482211711139	1k5 1% 0,1W	Autoreverse
3743	482211711449	2k2 1% 0,1W	Non-autoreverse
3744	482211711139	1k5 1% 0,1W	Autoreverse
3744	482211711449	2k2 1% 0,1W	Non-autoreverse
3745	482205120332	3k3 5% 0,1W	Autoreverse
3745	482205120562	5k6 5% 0,1W	Non-autoreverse
3746	482205120332	3k3 5% 0,1W	Autoreverse
3746	482205120562	5k6 5% 0,1W	Non-autoreverse
3748	482211711449	2k2 1% 0,1W	
3749	482211710834	47k 1% 0,1W	
3751	482211710833	10k 1% 0,1W	
3752	482211710837	100k 1% 0,1W	
3753	482211710837	100k 1% 0,1W	
3754	482205120105	1M 5% 0,1W	Autoreverse
3754	482205120479	47R 5% 0,1W	Non-autoreverse
3755	482205120105	1M 5% 0,1W	Autoreverse
3755	482205120479	47R 5% 0,1W	Non-autoreverse
3756	482211713579	220k 1% 0,1W	
3757	482211713579	220k 1% 0,1W	
3758	482211710833	10k 1% 0,1W	
3759	482211710833	10k 1% 0,1W	
3760	482205120121	120R 5% 0,1W	
3761	482205021003	10k 1% 0,6W	
3762	482211711454	820R 1% 0,1W	
3763	482205120154	150k 5% 0,1W	
3764	482211683872	220R 5% 0,5W	
3765	482205120393	39k 5% 0,1W	
3766	482205120475	4M7 5% 0,1W	
3767	482205120475	4M7 5% 0,1W	
3768	482211710833	10k 1% 0,1W	
3769	482211711383	12k 1% 0,1W	Autoreverse
3769	482205120822	8k2 5% 0,1W	Non-autoreverse
3770	482211711139	1k5 1% 0,1W	
3771	482205120122	1k2 5% 0,1W	
3772	482211711507	6k8 1% 0,1W	Autoreverse
3772	482205120562	5k6 5% 0,1W	Non-autoreverse
3773	482210012227	Trimmer 4k7 30% 0,1W	
3774	482211683933	15k 1% 0,1W	Autoreverse
3774	482205120822	8k2 5% 0,1W	Non-autoreverse
3775	482205120478	4R7 5% 0,1W	
3776	482211711507	6k8 1% 0,1W	
3777	482211710353	150R 1% 0,1W	
3778	482205210688	⚠ 6R8 5% 0,33W	
3779	482205120334	330k 5% 0,1W	
3780	482205120105	1M 5% 0,1W	
3781	482205120475	4M7 5% 0,1W	
3784	482205110102	1k 2% 0,25W	
3786	482205120223	22k 5% 0,1W	
3787	482205120105	1M 5% 0,1W	
3788	482205120105	1M 5% 0,1W	
3789	482211710834	47k 1% 0,1W	
4701	482205120008	0R Jumper 0805	
4702	482205120008	0R Jumper 0805	
4703	482205120008	0R Jumper 0805	
4704	482205120008	0R Jumper 0805	
4705	482205120008	0R Jumper 0805	

ELECTRICAL PARTS LIST - ETF7 NON-DOLBY BOARD

RESISTORS

4706	482205120008	0R Jumper 0805	
4707	482205120008	0R Jumper 0805	
4708	482205120008	0R Jumper 0805	
4709	482205120008	0R Jumper 0805	
4710	482205120008	0R Jumper 0805	
4711	482205120008	0R Jumper 0805	
4712	482205120008	0R Jumper 0805	
4713	482205120008	0R Jumper 0805	
4714	482205120008	0R Jumper 0805	
4715	482205120008	0R Jumper 0805	
4716	482205120008	0R Jumper 0805	
4717	482205120008	0R Jumper 0805	
4718	482205120008	0R Jumper 0805	
4719	482205120008	0R Jumper 0805	
4720	482205120008	0R Jumper 0805	
4721	482205120008	0R Jumper 0805	
4722	482205120008	0R Jumper 0805	
4723	482205120008	0R Jumper 0805	
4724	482205120008	0R Jumper 0805	
4725	482205120008	0R Jumper 0805	
4726	482205120008	0R Jumper 0805	
4727	482205120008	0R Jumper 0805	
4728	482205120008	0R Jumper 0805	
4729	482205120008	0R Jumper 0805	
4730	482205120008	0R Jumper 0805	
4731	482205120008	0R Jumper 0805	
4732	482205120008	0R Jumper 0805	
4733	482205120008	0R Jumper 0805	
4734	482205120008	0R Jumper 0805	
4735	482205120008	0R Jumper 0805	
4736	482205120008	0R Jumper 0805	
4737	482205120008	0R Jumper 0805	
4738	482205120008	0R Jumper 0805	
4739	482205120008	0R Jumper 0805	
4740	482205120008	0R Jumper 0805	
4741	482205120008	0R Jumper 0805	
4742	482205120008	0R Jumper 0805	
4744	482205120008	0R Jumper 0805	
4745	482205120008	0R Jumper 0805	
4746	482205120008	0R Jumper 0805	
4748	482205120008	0R Jumper 0805	
4785	482205120008	0R Jumper 0805	only for Ferro
4790	482205120008	0R Jumper 0805	
4794	482205120008	0R Jumper 0805	
4795	482205120008	0R Jumper 0805	

COILS & FILTERS

5701	482215711477	Coil 2,2µH 5%
5703	482215620946	Osc Coil 100kHz

DIODES

6611	482213031878	1N4003G	
6612	482213031878	1N4003G	
6614	482213030621	1N4148	Autoreverse
6770	482213030621	1N4148	
6771	482213030621	1N4148	
6772	482213030621	1N4148	
6773	482213030621	1N4148	
6774	482213030621	1N4148	
6775	482213030621	1N4148	
6776	482213030621	1N4148	
6777	482213034382	BZX79-F8V2	
6778	482213030621	1N4148	
6782	482213030621	1N4148	
6785	482213030621	1N4148	
6786	482213030621	1N4148	

TRANSISTORS & INTEGRATED CIRCUITS

7610	532220911306	HEF4094BT	
7612	482213011201	PMBT2907	
7613	482213011201	PMBT2907	
7614	482213011201	PMBT2907	
7616	482213060373	BC857B	Autoreverse
7618	482213060511	BC847B	
7619	482213060511	BC847B	
7620	482213060511	BC847B	
7622	482213060511	BC847B	Autoreverse
7623	482213060511	BC847B	
7624	482213060511	BC847B	
7710	482220932919	HEF4952BT	
7720	932214000668	AN7323S	
7730	482220932919	HEF4952BT	
7740	482220932919	HEF4952BT	
7780	482213060511	BC847B	
7781	482213042804	BC817-25	
7782	482213044568	BC557B	
7783	482213060511	BC847B	
7784	482213060373	BC857B	
7786	482213063494	J111	
7787	482213060511	BC847B	
7791	482213060511	BC847B	
7792	482213060511	BC847B	

Note: Only the parts mentioned in this list are normal service spare parts.

3CDC-LC-MP3CD2002

(3 Disc Carousel Changer+MP3 Board) Layout stage .2

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Service hints

CAUTION

CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CD MECHANISM. THAT´S WHY, BESIDES THE SAFETY MEASURES LIKE

- **SWITCH OFF POWER SUPPLY**
- **ESD PROTECTION**

ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

The following steps have to be done when replacing the CD mechanism:

1. Disconnect flexfoil cable from the old CD drive
2. Put a paperclip on the flexfoil to short-circuit the contacts (fig.1)
3. Remove the old CD drive
4. Remove paperclip from the flexfoil and connect it to the new drive
5. Position the new CD drive in its studs
6. Remove solder joint from the Laserunit

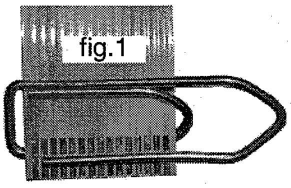
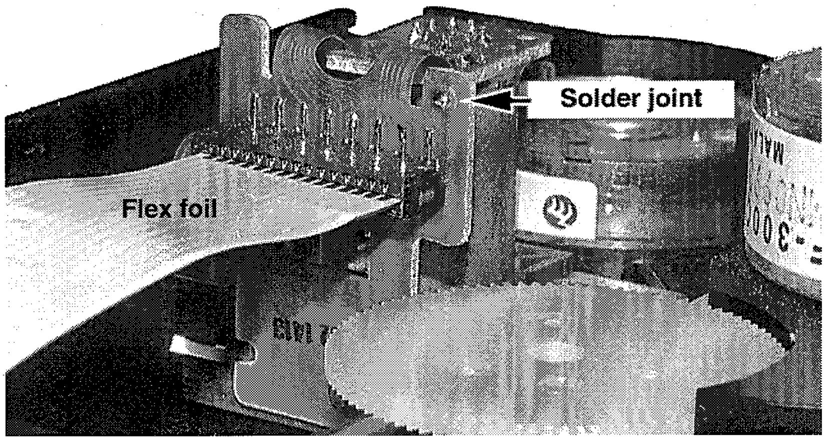


fig.1

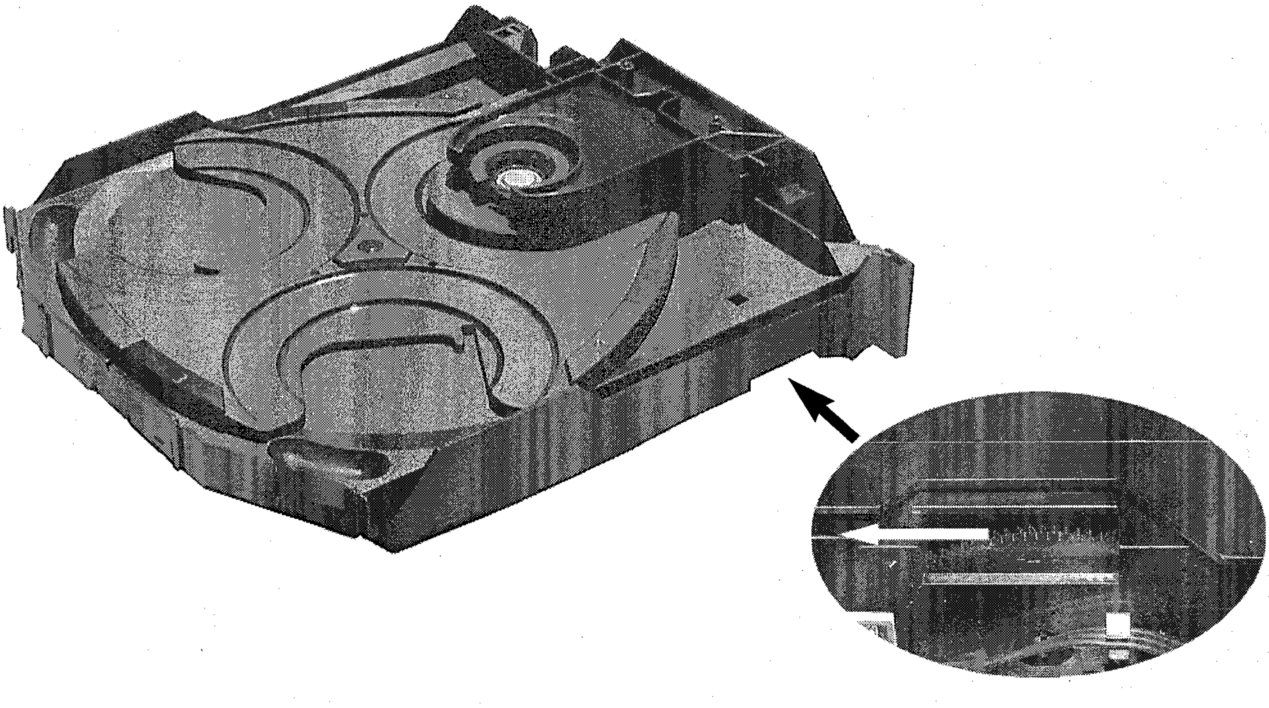
Attention: The laser diode of this CD drive is protected against ESD by a solder joint which shortcircuits the laserdiode to ground.
For proper functionality of the CD drive this solder joint must be removed **after** connection the drive to the set.



Emergency open

In case of a Supply fault, the tray can be opened manually.

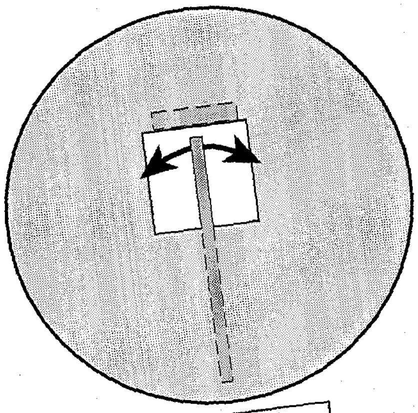
1. Remove the top cover of the set to get access to the Changer Module.
2. Turn gearwheel clockwise (as shown in picture below).



Service hints

Dismantling of Tray

1. Open the tray.
2. Release 2x catch as shown in fig. 2 and Detail A
3. Pull tray out.



Detail A

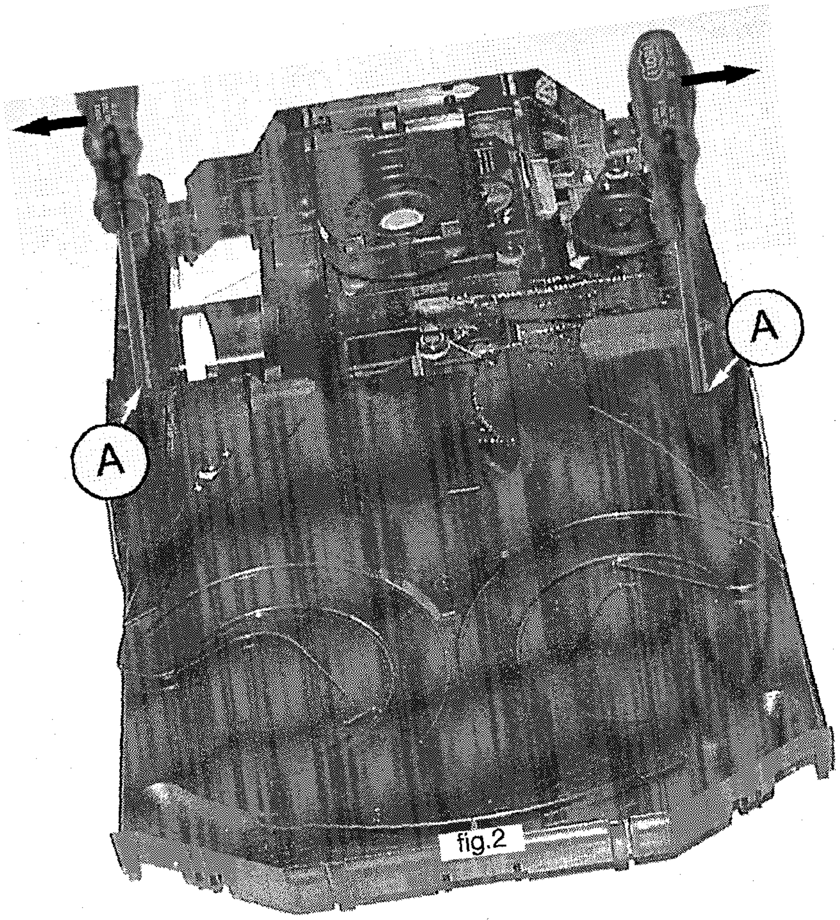
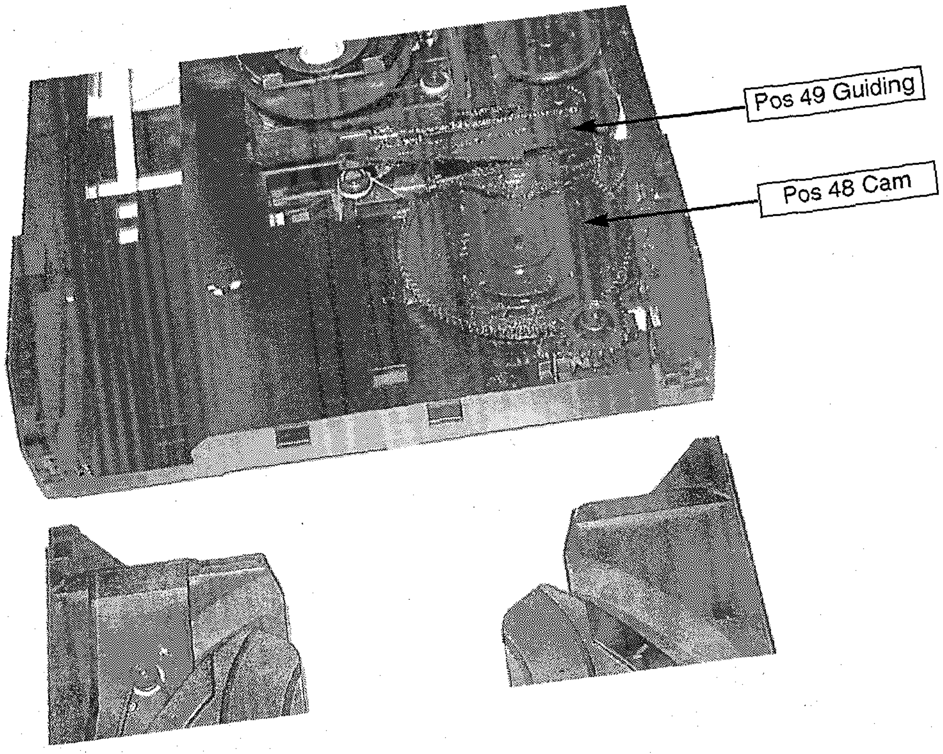


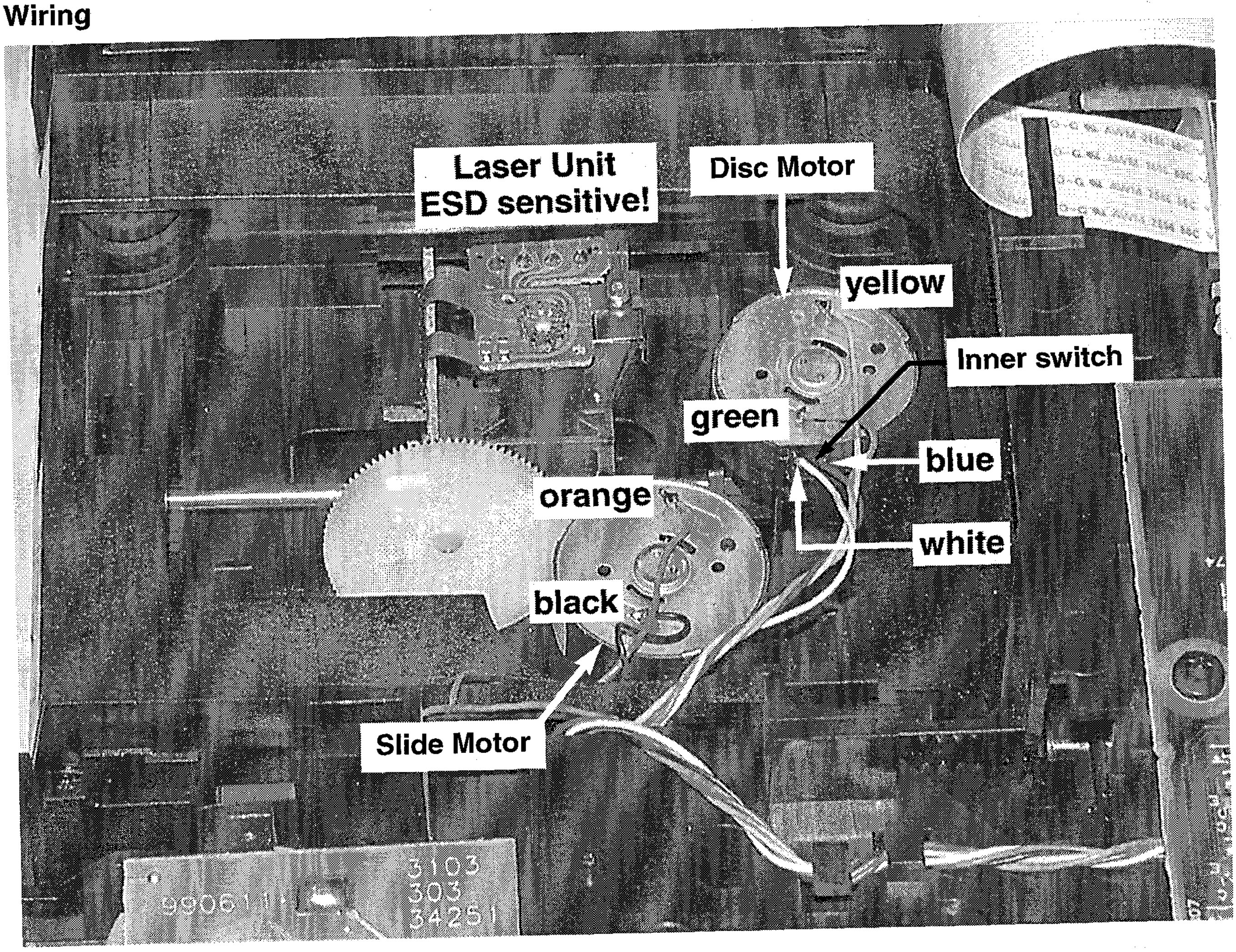
fig.2

Assembling of Tray

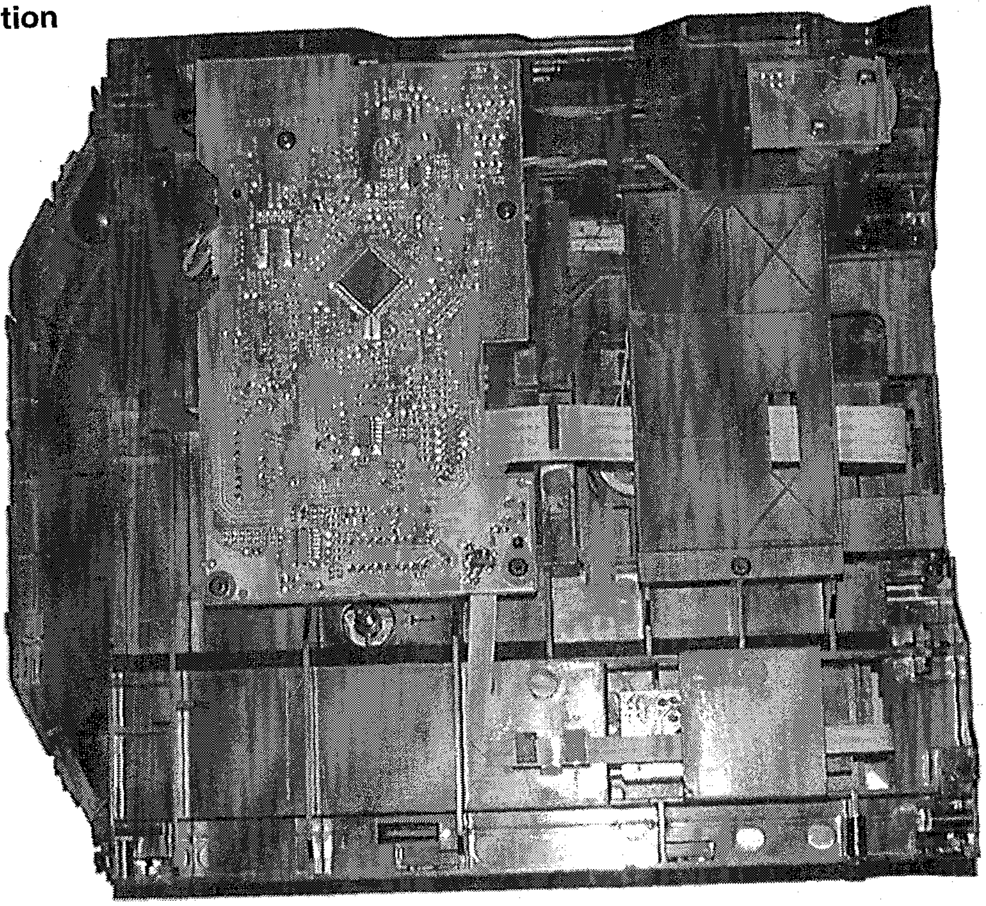
1. Turn Cam (pos. 48) clockwise to end position.
2. If necessary - move Guiding (pos. 49) to the right end position.
3. Insert the Tray.



Wiring

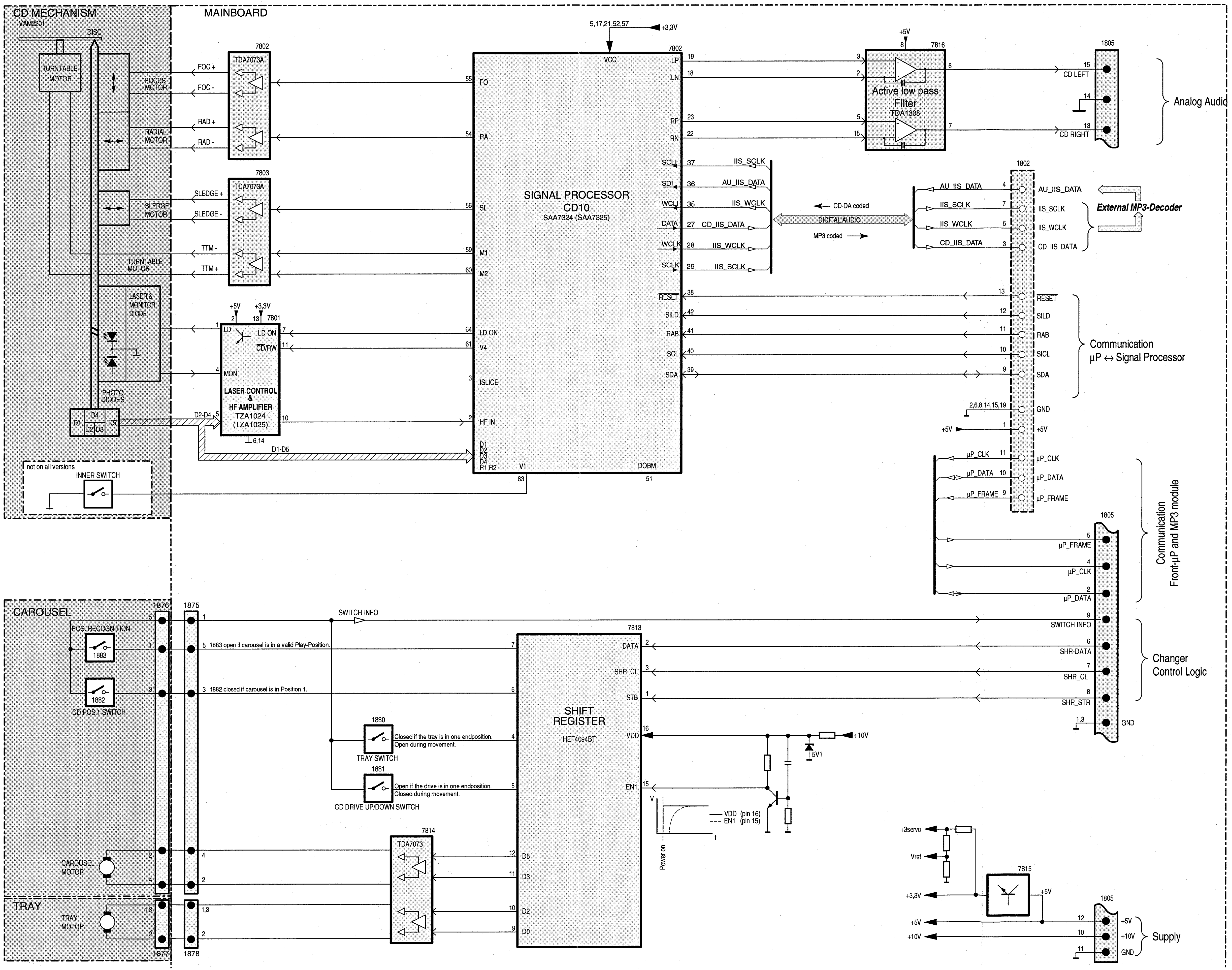

Laser Unit
ESD sensitive!
Disc Motor
yellow
Inner switch
green
blue
orange
white
black
Slide Motor
3103
303
34251
9906

Service Position

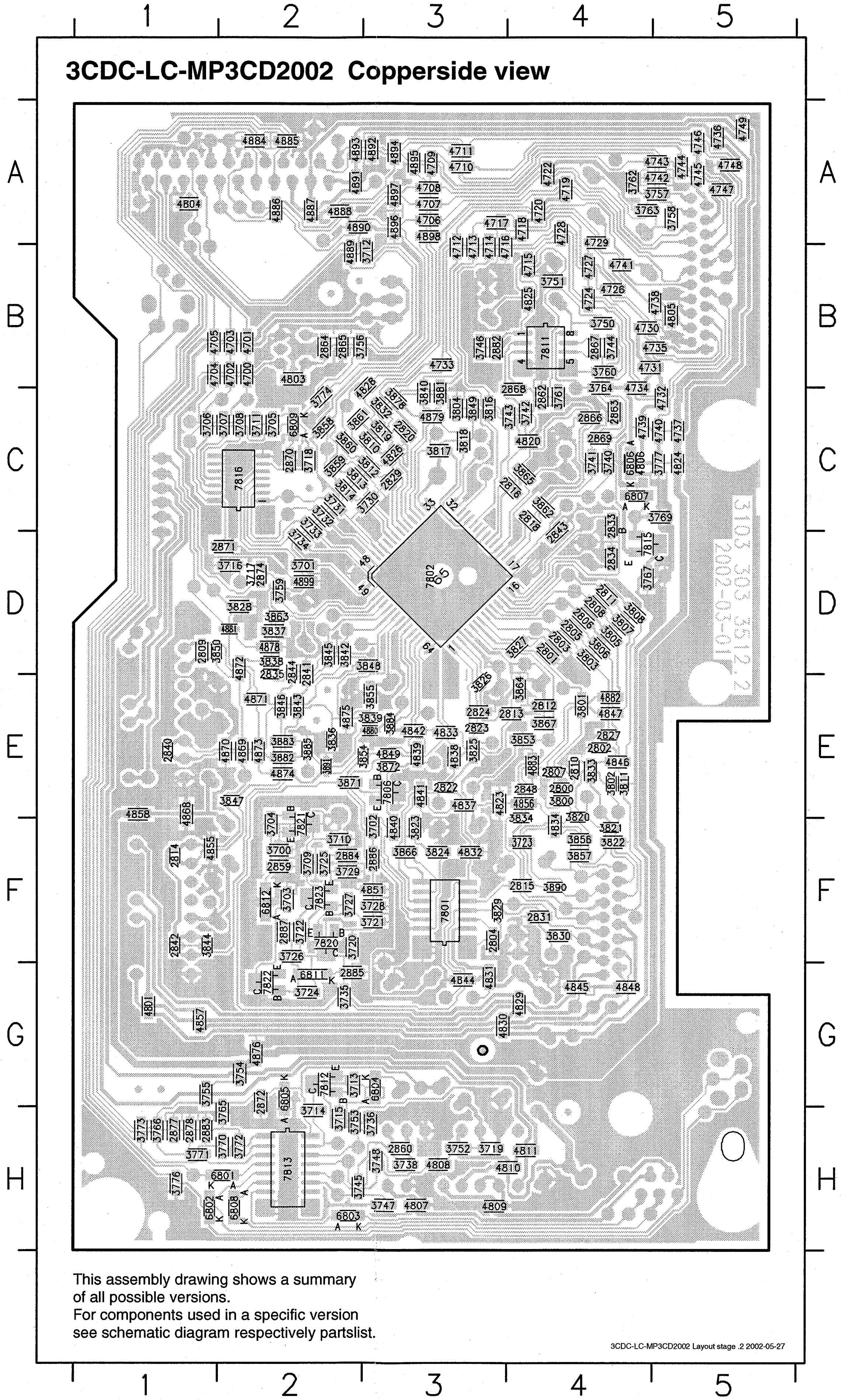


Blockdiagram

BLOCK DIAGRAM 3CDC-LC MP3 Version


CD MECHANISM
VAM2201
DISC
TURNTABLE MOTOR
FOCUS MOTOR
RADIAL MOTOR
SLEDGE MOTOR
TURNTABLE MOTOR
LASER & MONITOR DIODE
PHOTO DIODES
D1
D2
D3
D4
D5
not on all versions
INNER SWITCH
MAINBOARD
7802
TDA7073A
FOC +
FOC -
RAD +
RAD -
7803
TDA7073A
SLEDGE +
SLEDGE -
TTM -
TTM +
+5V
+3,3V
7801
LD
LD ON
CD/RW
MON
LASER CONTROL & HF AMPLIFIER
TZA1024 (TZA1025)
6,14
D2-D4
D1-D5
5,17,21,52,57
+3,3V
7802
VCC
FO
RA
SL
M1
M2
LD ON
V4
ISLICE
HF IN
D1 D2 D3 D4 R1,R2
V1
DOBM
SIGNAL PROCESSOR CD10
SAA7324 (SAA7325)
LP
LN
RP
RN
SCL
SDI
WCLI
DATA
WCLK
SCLK
IIS_SCLK
AU_IIS_DATA
IIS_WCLK
CD_IIS_DATA
IIS_WCLK
IIS_SCLK
RESET
SILD
RAB
SCL
SDA
CD-DA coded
DIGITAL AUDIO
MP3 coded
+5V
7816
Active low pass Filter
TDA1308
1805
CD LEFT
CD RIGHT
Analog Audi
1802
AU_IIS_DATA
IIS_SCLK
IIS_WCLK
CD_IIS_DATA
External MP3-Decoder
RESET
SILD
RAB
SICL
SDA
GND
+5V
Communication µP ↔ Signal Processor
µP_CLK
µP_DATA
µP_FRAME
1805
µP_FRAME
µP_CLK
µP_DATA
Communication Front-µP and MP3 module
SWITCH INFO
SHR-DATA
SHR_CL
SHR_STR
GND
Changer Control Logic
CAROUSEL
1876
1875
POS. RECOGNITION
1883
1882
CD POS.1 SWITCH
SWITCH INFO
1883 open if carousel is in a valid Play-Position.
1882 closed if carousel is in Position 1.
1880
Closed if the tray is in one endposition. Open during movement.
TRAY SWITCH
1881
Open if the drive is in one endposition. Closed during movement.
CD DRIVE UP/DOWN SWITCH
7813
DATA
SHR_CL
STB
VDD
EN1
SHIFT REGISTER
HEF4094BT
+10V
5V1
V
VDD (pin 16)
EN1 (pin 15)
Power on
t
CAROUSEL MOTOR
TRAY
TRAY MOTOR
1877
1878
7814
TDA7073
D5
D3
D2
D0
+3servo
Vref
+3,3V
7815
+5V
1805
+5V
+10V
GND
Supply

3CDC-LC-MP3CD2002 Copperside view



This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

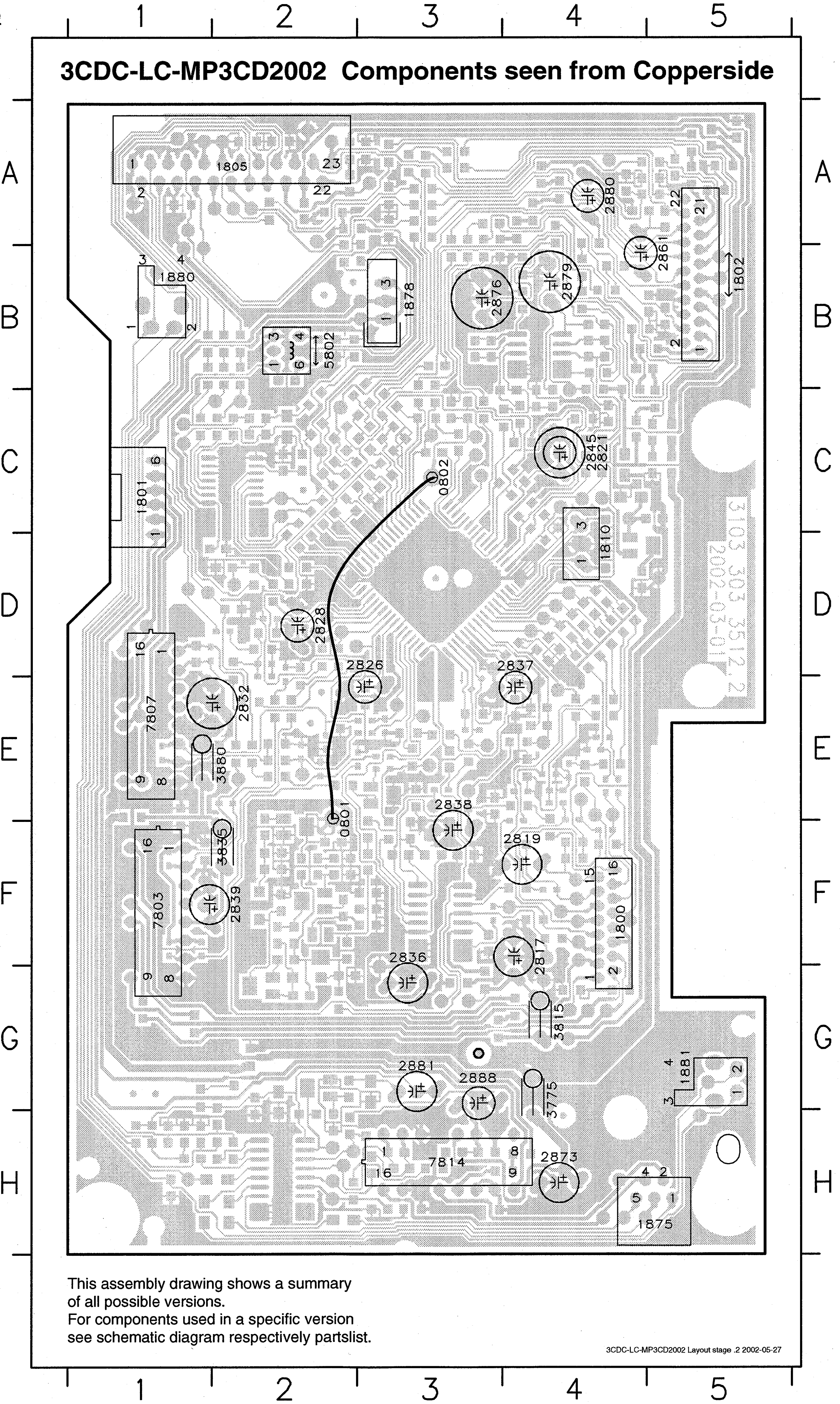
3CDC-LC-MP3CD2002 Layout stage .2 2002-05-27

Mapping

Copperside	
2800	E4
2801	D4
2802	E4
2803	D4
2804	F3
2805	D4
2806	D4
2807	E4
2808	D4
2809	D1
2810	E4
2811	D4
2812	E4
2813	E4
2814	F1
2815	F4
2816	C4
2818	C4
2820	C3
2822	E3
2823	E3
2824	E3
2827	E4
2829	C3
2831	F4
2833	C4
2834	D4
2835	D2
2840	E1
2841	D2
2842	F1
2843	D4
2844	D2
2848	E4
2859	F2
2860	H3
2862	C4
2863	C4
2864	B2
2865	B2
2866	C4
2867	B4
2868	C4
2869	C4
2870	C2
2871	D2
2872	G2
2874	D2
2877	H1
2878	H1
2882	B3
2883	H1
2884	F2
2885	G2
2886	F3
2887	F2
3700	F2
3701	D2
3702	F3
3703	F2
3704	F2
3705	C2
3706	C1
3707	C2
3708	C2
3709	F2
3710	F2
3711	C2
3712	B3
3713	G2
3714	H2
3715	H2
3716	D2
3717	D2
3718	C2
3719	H3
3720	F2
3721	F3
3722	F2
3723	F4
3724	G2
3725	F2
3726	F2
3727	F2
3728	F3
3729	F2
3730	C3
3731	C2
3732	C2
3733	C2
3734	D2
3735	G2
3736	H3
3738	H3
3740	C4
3741	C4
3742	C4
3743	C4
3744	B4
3745	H2
3746	B3
3747	H3
3748	H3
3750	B4
3751	B4
3752	H3
3753	H2
3754	G2
3755	G1
3756	B2
3757	A5
3758	A5
3759	D2
3760	B4
3761	C4
3762	A4
3763	A4
3764	C4
3765	H2
3766	H1
3767	D4
3769	C5
3770	H2
3771	H1
3772	H2
3773	H1
3774	C2
3776	H1
3777	C5
3800	E4
3801	E4
3802	E4
3803	D4
3804	C3
3805	D4
3806	D4
3807	D4
3808	D4
3810	C3
3811	E4
3812	C3
3813	C2
3814	C2
3816	C3
3817	C3
3818	C3
3819	C3
3820	E4
3821	F4
3822	F4
3823	F3
3824	F3
3825	E3
3826	E3
3827	D4
3828	D2
3829	F3
3830	F4
3832	C3
3833	E4
3834	E4
3836	E2
3837	D2
3838	D2
3839	E3
3840	C3
3842	D2
3843	E2
3844	F1
3845	D2
3846	E2
3847	E2
3848	D3
3849	C3
3850	D1
3853	E4
3854	E3
3855	E3
3856	F4
3857	F4
3858	C2
3859	C2
3860	C2
3861	C2
3862	C4
3863	D2
3864	E4
3865	C4
3866	F3
3867	E4
3871	E2
3872	E3
3878	C3
3881	C3
3882	E2
3883	E2
3884	E3
3885	E2
3890	F4
3891	E2
4700	B2
4701	B2
4702	B2
4703	B2
4704	B1
4705	B1
4706	A3
4707	A3
4708	A3
4709	A3
4710	A3
4711	A3
4712	B3
4713	B3
4714	B3
4715	B4
4716	B3
4717	A3
4718	A4
4719	A4
4720	A4
4722	A4
4724	B4
4726	B4
4727	B4
4728	A4
4729	A4
4730	B4
4731	B4
4732	C5
4733	B3
4734	C4
4735	B5
4736	A5
4737	C5
4738	B5
4739	C4
4740	C5
4741	B4
4742	A5
4743	A5
4744	A5
4745	A5
4746	A5
4747	A5
4748	A5
4749	A5
4801	G1
4803	B2
4804	A1
4805	B5
4806	C4
4807	H3
4808	H3
4809	H3
4810	H4
4811	H4
4820	C4
4823	E3
4824	C5
4825	B4
4826	C3
4828	C3
4829	G4
4830	G3
4831	G3
4832	F3
4833	E3
4834	F4
4837	E3
4838	E3
4839	E3
4840	F3
4841	E3
4842	E3
4844	G3
4845	G4
4846	E4
4847	E4
4848	G4
4849	E3
4851	F3
4855	F1
4856	E4
4857	G1
4858	E1
4868	E1
4869	E2
4870	E2
4871	E2
4872	D2
4873	E2
4874	E2
4875	E2
4876	G2
4878	D2
4879	C3
4880	E3
4881	D2
4882	E4
4883	E4
4884	A2
4885	A2
4886	A2
4887	A2
4888	A2
4889	B2
4890	A2
4891	A2
4892	A3
4893	A2
4894	A3
4895	A3
4896	A3
4897	A3
4898	A3
4899	D2
6801	H2
6802	H1
6803	H2
6804	G3
6805	G2
6806	C4
6807	C4
6808	H2
6809	C2
6811	G2
6812	F2
7801	F3
7802	D3
7806	E3
7811	B4
7812	G2
7813	H2
7815	D4
7816	C2
7820	F2
7821	F2
7822	G2
7823	F2

Componentside	
1451	B5
1455	A4
2450	C1
2451	B1
2452	C2
2453	B1
2454	B1
2455	D2
2457	A2
2461	D4
2463	A3
2464	D4
2465	D4
2466	A3
2467	B4
2468	B4
2469	B4
2472	D3
3450	C1
3451	B1
3454	D2
3465	C1
3467	A3
3468	A3
3469	C4
3470	D3
3471	C4
3473	C4
3474	A3
3475	C4
3476	C4
3477	B4
3479	A2
3480	C4
3481	C4
3484	B4
3490	A4
3494	A2
3496	A4
3499	C1
4450	A4
6451	D4
7451	B3
7456	D4
7458	D1

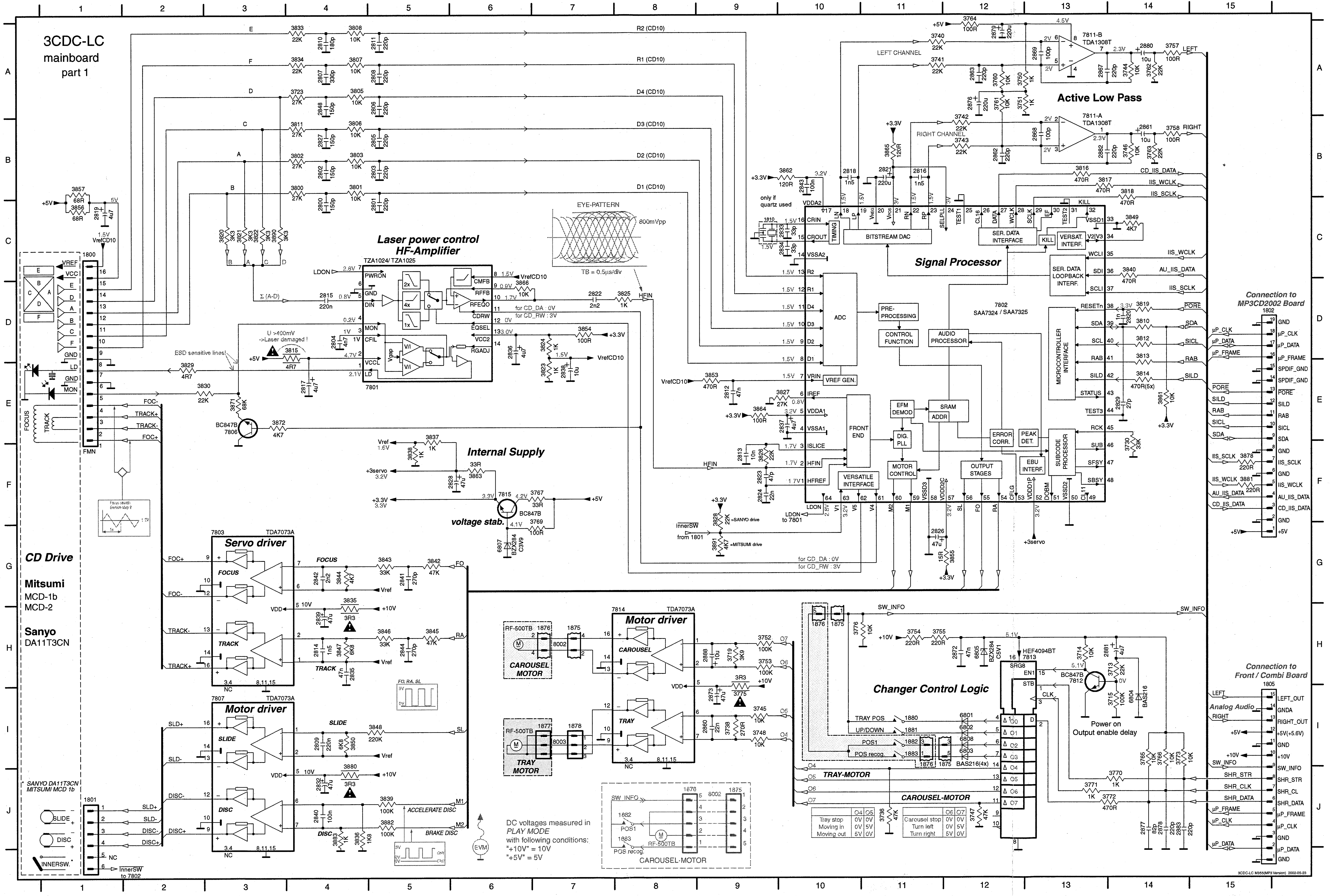
3CDC-LC-MP3CD2002 Components seen from Copperside



This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

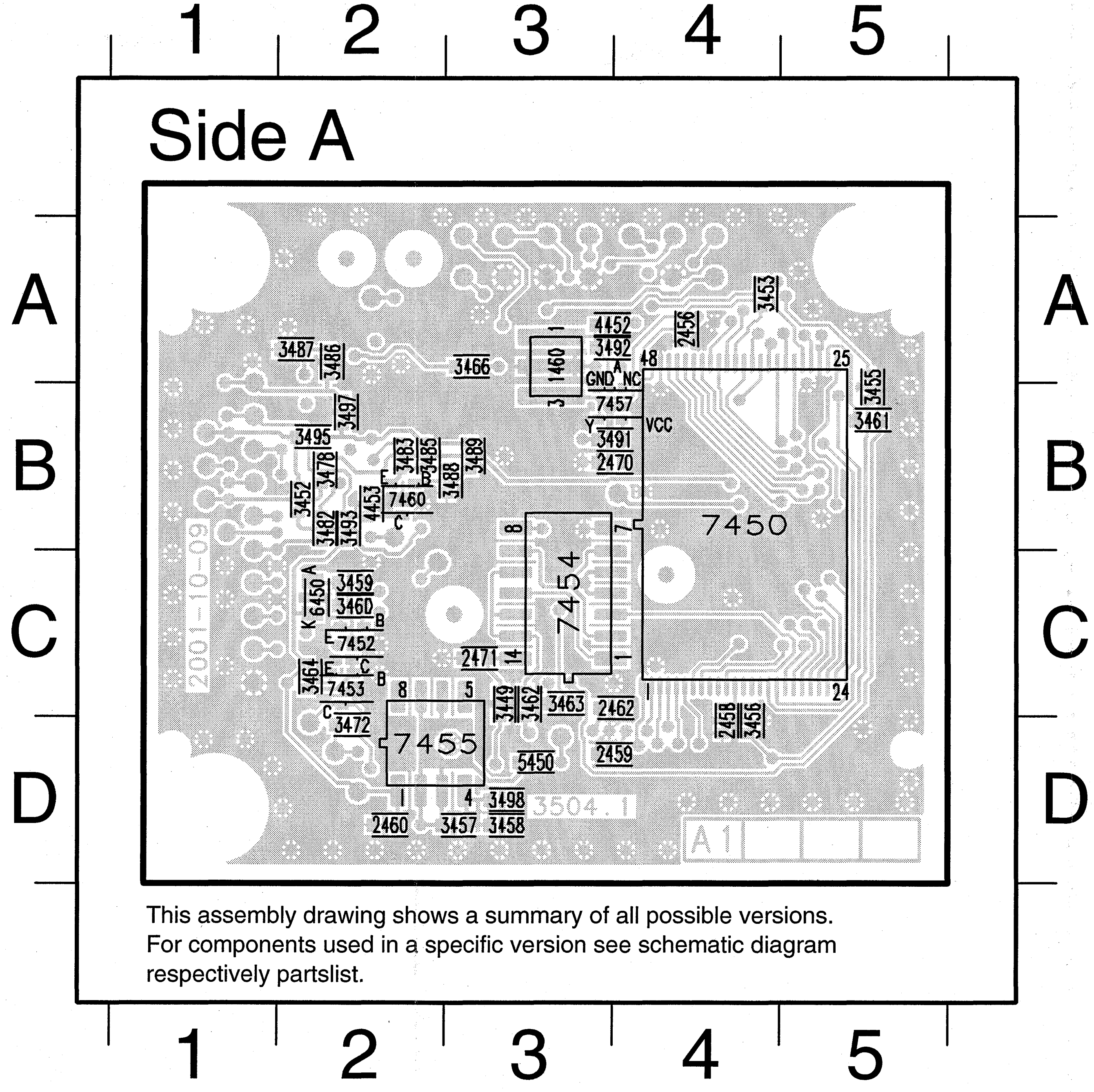
3CDC-LC-MP3CD2002 Layout stage .2 2002-05-27

1800	C1
1801	J1
1802	D15
1805	I15
1810	C9
1875	H10
1875	H7
1875	I12
1876	H10
1876	H7
1876	I11
1877	I7
1878	I7
1880	I11
1881	I11
1882	I11
1883	I11
2800	C4
2801	C5
2802	B4
2803	B5
2804	D4
2805	B5
2806	A5
2807	A4
2808	A5
2809	I4
2810	A4
2811	A5
2812	E9
2813	F9
2814	H4
2815	D4
2816	B11
2817	E4
2818	B10
2819	C1
2820	D14
2821	B11
2822	D7
2823	F9
2824	F9
2826	G11
2827	B4
2828	F6
2829	E14
2832	J4
2833	C10
2834	C10
2835	H4
2836	D6
2837	E10
2838	E7
2839	H4
2840	J4
2841	G5
2842	G4
2843	B10
2844	H5
2848	A4
2860	I9
2861	B14
2862	B12
2863	A12
2867	A13
2868	B13
2869	A13
2872	H12
2873	I9
2876	A12
2877	J14
2878	J14
2879	A12
2880	A14
2881	H14
2882	B13
2883	J14
2888	H9
3713	H14
3714	H13
3715	I14
3719	H9
3723	A4
3730	F14
3736	J11
3738	I9
3740	A11
3741	A11
3742	B12
3743	B12
3744	A14
3745	I9
3746	B14
3747	J12
3748	I9
3750	A12
3751	A12
3752	H9
3753	H9
3754	H11
3755	H11
3757	A14
3758	B14
3760	A12
3761	A12
3762	A14
3763	B14
3764	A12
3765	I14
3766	I14
3767	F7
3769	G7
3770	J14
3771	J13
3772	J14
3773	I14
3775	I9
3776	H11
3800	B4
3801	B4
3802	B4
3803	B4
3805	A4
3806	B4
3807	A4
3808	A4
3810	D14
3811	B4
3812	D14
3813	E14
3814	E14
3815	D4
3816	B13
3817	B13
3818	B14
3819	D14
3820	C3
3821	C3
3822	C3
3823	E7
3824	D7
3825	D8
3826	F9
3827	E10
3828	F9
3829	E2
3830	E2
3832	E14
3833	A4
3834	A4
3835	H4
3836	J4
3837	E5
3838	F5
3839	J5
3840	C14
3842	G5
3843	G5
3844	G4
3845	H5
3846	H5
3847	H4
3848	I5
3849	C14
3850	I4
3853	E9
3854	D7
3855	G12
3856	C1
3857	B1
3861	E14
3862	B10
3863	F6
3864	E9
3865	B11
3866	D6
3871	E3
3872	E3
3878	F15
3880	J4
3881	F15
3882	J5
3883	J4
3890	C3
3891	G9
6801	I12
6802	I12
6803	I12
6804	I14
6805	H12
6807	G6
6808	I12
7801	D5
7802	D12
7803	G3
7806	E3
7807	I3
7811-A	B13
7811-B	A13
7812	H13
7813	H13
7814	H8
7815	F6



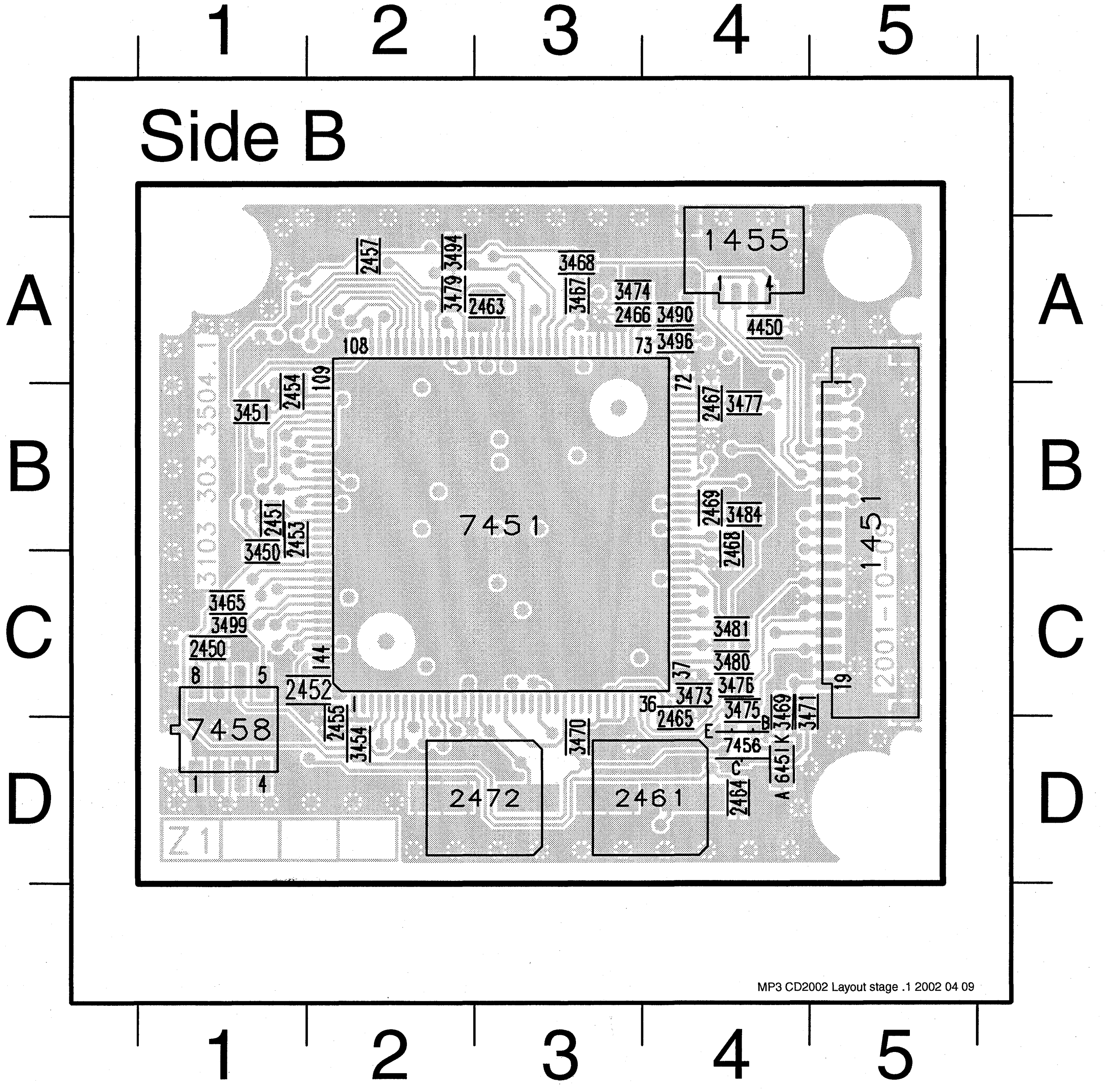
3CDC-LC
mainboard
part 1
Laser power control
HF-Amplifier
TZA1024/TZA1025
7801
Internal Supply
voltage stab.
EYE-PATTERN
800mVpp
TB = 0.5µs/div
Signal Processor
7802
SAA7324 / SAA7325
BITSTREAM DAC
ADC
PRE-PROCESSING
CONTROL FUNCTION
AUDIO PROCESSOR
SER. DATA INTERFACE
SER. DATA LOOPBACK INTERF.
MICROCONTROLLER INTERFACE
VREF GEN.
FRONT END
EFM DEMOD
SRAM
ADDR
DIG. PLL
MOTOR CONTROL
ERROR CORR.
PEAK DET.
OUTPUT STAGES
EBU INTERF.
SUBCODE PROCESSOR
VERSATILE INTERFACE
TIMING
KILL
VERSAT. INTERF.
Active Low Pass
7811-A TDA1308T
7811-B TDA1308T
LEFT CHANNEL
RIGHT CHANNEL
LEFT
RIGHT
only if quartz used
U >400mV ->Laser damaged !
ESD sensitive lines!
for CD_DA : 0V
for CD_RW : 3V
CD Drive
Mitsumi
MCD-1b
MCD-2
Sanyo
DA11T3CN
SANYO DA11T3CN
MITSUMI MCD 1b
FOCUS
TRACK
SLIDE
DISC
INNERSW.
FMN
Servo driver
7803 TDA7073A
Motor driver
7807 TDA7073A
7814 TDA7073A
ACCELERATE DISC
BRAKE DISC
FO, RA, SL
RF-500TB
CAROUSEL MOTOR
TRAY MOTOR
Changer Control Logic
HEF4094BT 7813
SRG8
BC847B 7812
Power on
Output enable delay
TRAY-MOTOR
CAROUSEL-MOTOR
BAS216(4x)
TRAY POS
UP/DOWN
POS1
POS recog.
SW_INFO
DC voltages measured in PLAY MODE with following conditions:
"+10V" = 10V
"+5V" = 5V
	O4	O5
Tray stop	0V	0V
Moving in	0V	5V
Moving out	5V	0V
	O6	O7
Carousel stop	0V	0V
Turn left	0V	5V
Turn right	5V	0V
Connection to MP3CD2002 Board
1802
Connection to Front / Combi Board
1805
Analog Audio
3CDC-LC M355(MP3 Version) 2002-05-23

1460	A3	3449	C3	3460	C2	3482	B2	3492	A3	6450	C2
2456	A4	3452	B2	3461	B5	3483	B2	3493	B2	7450	B4
2458	D4	3453	A4	3462	C3	3485	B2	3495	B2	7452	C2
2459	D4	3455	B5	3463	C3	3486	A2	3497	B2	7453	C2
2460	D2	3456	D4	3464	C2	3487	A2	3498	D3	7454	C3
2462	C4	3457	D3	3466	A3	3488	B3	4452	A3	7455	D2
2470	B4	3458	D3	3472	D2	3489	B3	4453	B2	7457	B4
2471	C3	3459	C2	3478	B2	3491	B4	5450	D3	7460	B2


1
2
3
4
5
A
B
C
D
Side A
7450
7454
7455
1460
7457
7460
7452
7453
6450
3487
3486
3466
4452
3492
2456
3453
3455
3461
3497
3495
3478
3452
3482
3493
4453
3483
3485
3488
3489
3491
2470
GND
NC
VCC
3459
3460
3464
2471
3449
3462
3463
2462
2459
2458
3456
5450
3472
2460
3457
3458
3498
3504.1
2001-10-09
A1
48
25
24
8
1
14
5
4

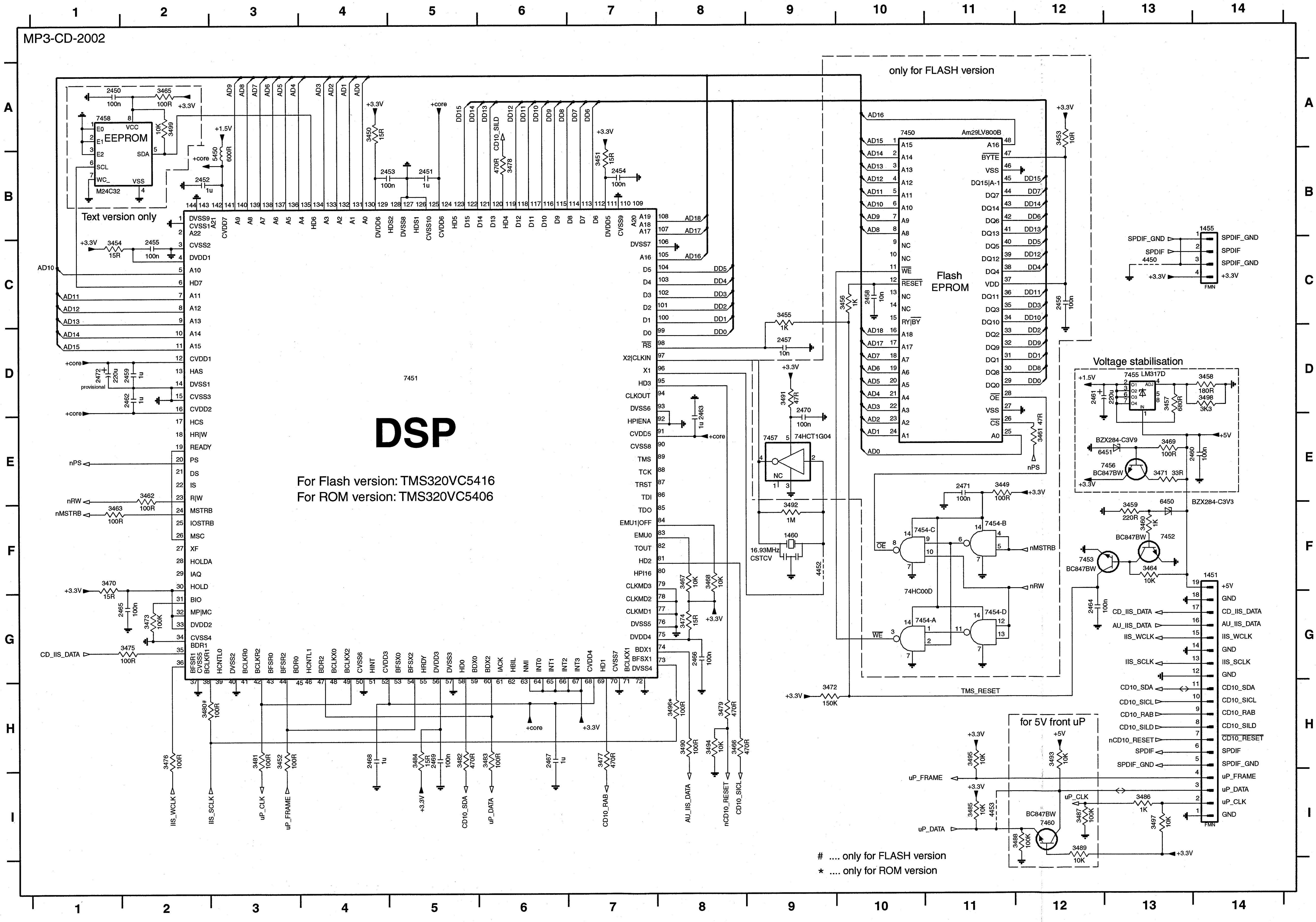
This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

1451	B5	2457	A2	2469	B4	3469	C4	3479	A2	4450	A4
1455	A4	2461	D4	2472	D3	3470	D3	3480	C4	6451	D4
2450	C1	2463	A3	3450	C1	3471	C4	3481	C4	7451	B3
2451	B1	2464	D4	3451	B1	3473	C4	3484	B4	7456	D4
2452	C2	2465	D4	3454	D2	3474	A3	3490	A4	7458	D1
2453	B1	2466	A3	3465	C1	3475	C4	3494	A2		
2454	B1	2467	B4	3467	A3	3476	C4	3496	A4		
2455	D2	2468	B4	3468	A3	3477	B4	3499	C1		


1
2
3
4
5
A
B
C
D
Side B
7451
7458
7456
1455
1451
2472
2461
2457
3479
3494
2463
3468
3467
3474
2466
3490
3496
4450
3451
2454
2467
3477
2451
2453
3450
2469
3484
2468
3465
3499
2450
2452
2455
3454
3470
3481
3480
3476
3473
3475
2465
3469
3471
6451
2464
108
109
73
72
144
37
36
19
3103 303 3504.1
2001-10-09
Z1

MP3 CD2002 Layout stage .1 2002 04 09

10-9


MP3-CD-2002
1
2
3
4
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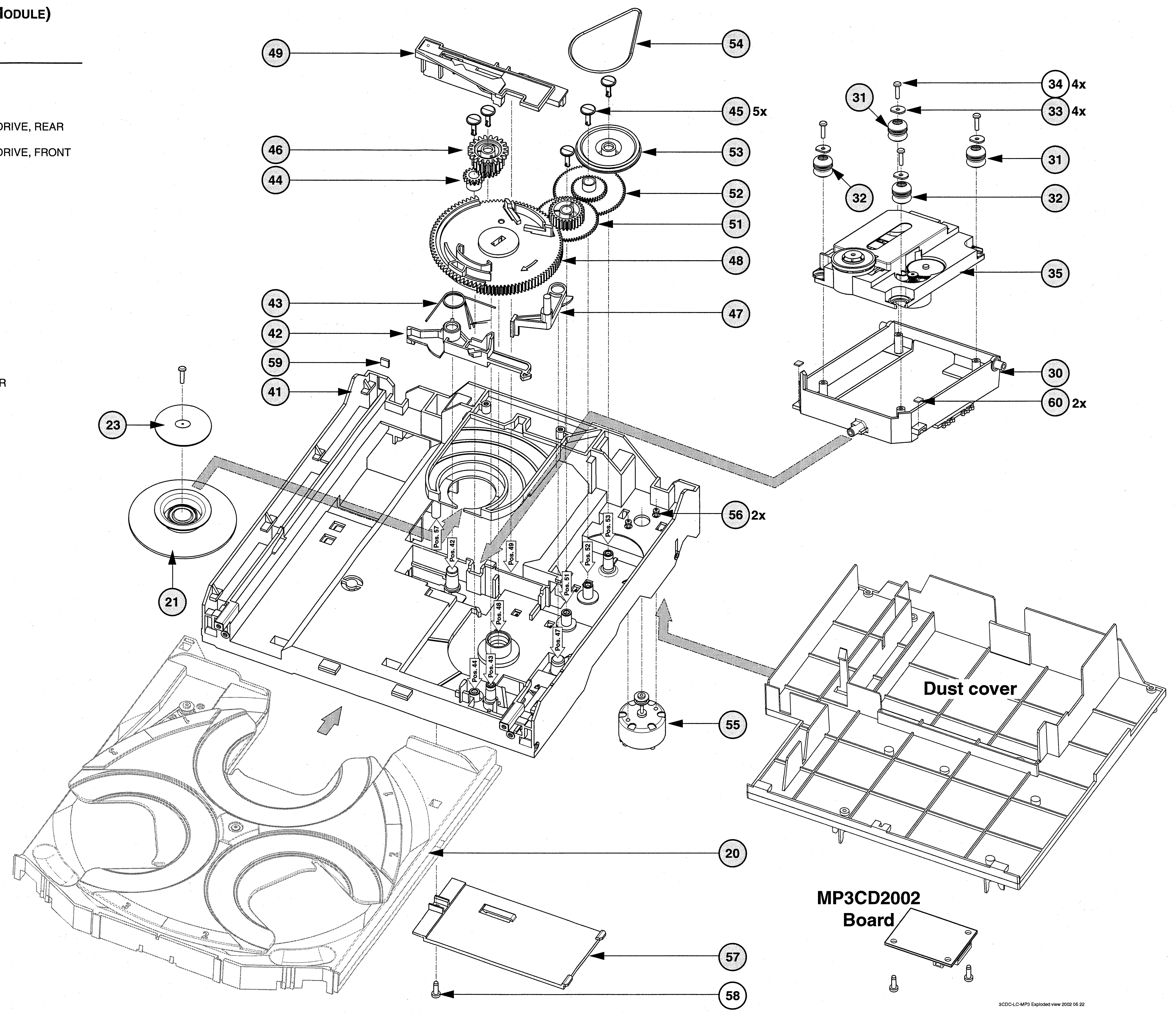
6
7
8
9
10
11
12
13
14
A
B
C
D
E
F
G
H
I
EEPROM
M24C32
7458
Text version only
DSP
7451
For Flash version: TMS320VC5416
For ROM version: TMS320VC5406
only for FLASH version
Flash EPROM
7450
Am29LV800B
Voltage stabilisation
7455 LM317D
for 5V front uP
7457 74HCT1G04
74HC00D
7454-A
7454-B
7454-C
7454-D
1460
16.93MHz CSTCV
BC847BW
7452
7453
7456
7460
BZX284-C3V9
BZX284-C3V3
6450
6451
1451
1455
FMN
+3.3V
+1.5V
+5V
+core
nPS
nRW
nMSTRB
CD_IIS_DATA
AU_IIS_DATA
IIS_WCLK
IIS_SCLK
CD10_SDA
CD10_SICL
CD10_RAB
CD10_SILD
nCD10_RESET
SPDIF
SPDIF_GND
uP_FRAME
uP_DATA
uP_CLK
GND
TMS_RESET
# .... only for FLASH version
* .... only for ROM version

2451	B5
2452	B2
2453	B4
2454	B7
2455	C2
2456	C12
2457	D9
2458	C10
2459	D2
2460	E13
2461	D12
2462	D2
2463	D8
2464	G12
2465	G2
2466	G8
2467	H6
2468	H4
2469	H5
2470	D9
2471	E11
2472	D1
3449	E11
3450	A4
3451	B7
3452	H3
3453	A12
3454	C1
3455	C9
3456	C10
3457	D13
3458	D14
3459	F13
3460	F13
3461	E12
3462	E2
3463	F1
3464	F13
3465	A2
3466	H8
3467	F8
3468	F8
3469	E13
3470	F1
3471	E13
3472	H9
3473	G2
3474	G8
3475	G2
3476	H2
3477	H7
3478	B6
3479	H8
3480	H2
3481	H3
3482	H5
3483	H6
3484	H5
3485	I11
3486	I13
3487	I12
3488	I12
3489	I12
3490	H8
3491	D9
3492	F9
3493	H12
3494	H8
3495	H11
3496	H8
3497	I13
3498	D14
3499	A2
4450	C13
4452	F9
4453	I11
5450	B3
6450	E13
6451	E13
7450	A10
7451	D5
7452	F13
7453	F12
7454-A	G11
7454-B	F11
7454-C	F11
7454-D	G11
7455	D13
7456	E12
7457	E9
7458	A1
7460	I12

EXPLODED VIEW (3CDC-LC MODULE)

MECHANICAL PARTS ***Loader***

20	3103 304 66500	DRAWER BLACK
21	3140 114 29070	PRESSURE RING-DA11
23	3140 111 21270	METAL RING-DA11
30	3103 304 66560	SUPPORT
31	4822 529 10386	RUBBER DAMPER CD DRIVE, REAR
32	4822 529 10387	RUBBER DAMPER CD DRIVE, FRONT
33	3103 304 06970	WASHER
35	3103 309 05350	CD DRIVE MCD1B
41	3103 304 66480	FRAME
42	3103 304 66540	BRACKET-GUIDING
43	3103 301 06460	SPRING-GUIDING
44	3103 304 06890	GEAR-3
45	3103 304 06980	NAIL FIXATION
46	3103 304 06880	GEAR-2
47	3103 304 66530	BRACKET-LOAD
48	3103 304 06910	CAM
49	3103 304 66510	GUIDING
51	3103 304 06900	GEAR-4
52	3103 304 06870	GEAR-1
53	3103 304 06960	PULLEY-FRAME
54	3103 304 66910	DRIVING-BELT-DRAWER
55	4822 361 10753	TRAY MOTOR
56	4822 502 12548	SCREW M2,6X3,5
57	3103 304 69880	COVER-DA11
59	4822 466 12146	RUBBER


49
54
34 4x
31
33 4x
45 5x
46
53
44
52
32
31
32
51
48
35
43
47
42
59
41
30
60 2x
23
56 2x
Pos. 57
Pos. 42
Pos. 49
Pos. 53
Pos. 52
Pos. 51
Pos. 48
Pos. 47
Pos. 44
Pos. 43
21
Dust cover
55
20
MP3CD2002
Board
57
58

3CDC-LC-MP3 Exploded view 2002 05 22

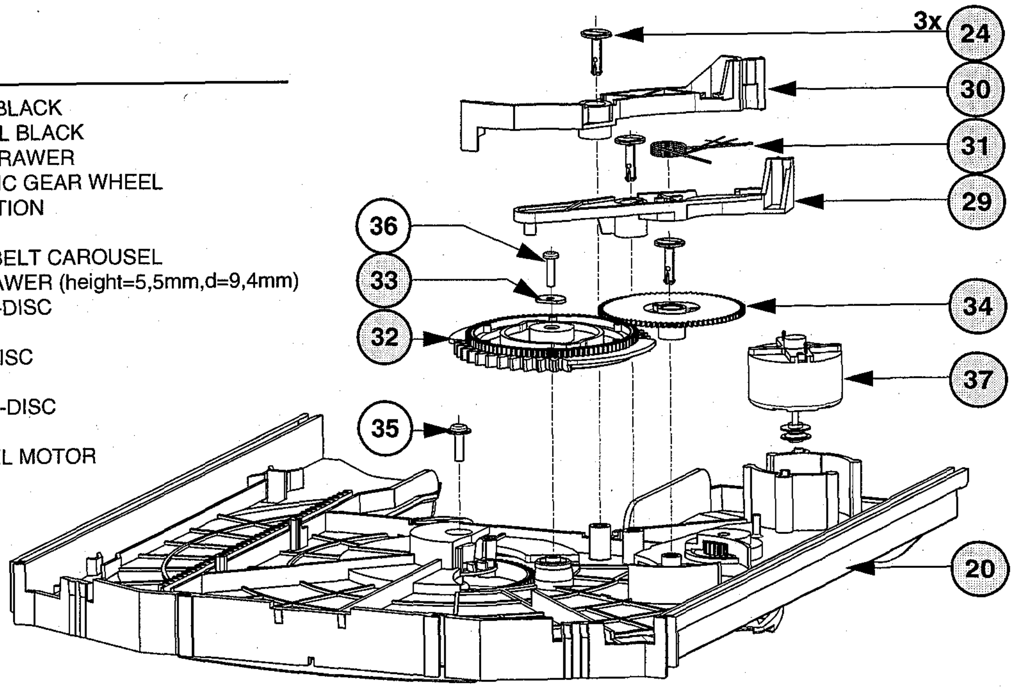
Ⓧ spare part

Ⓨ non spare part

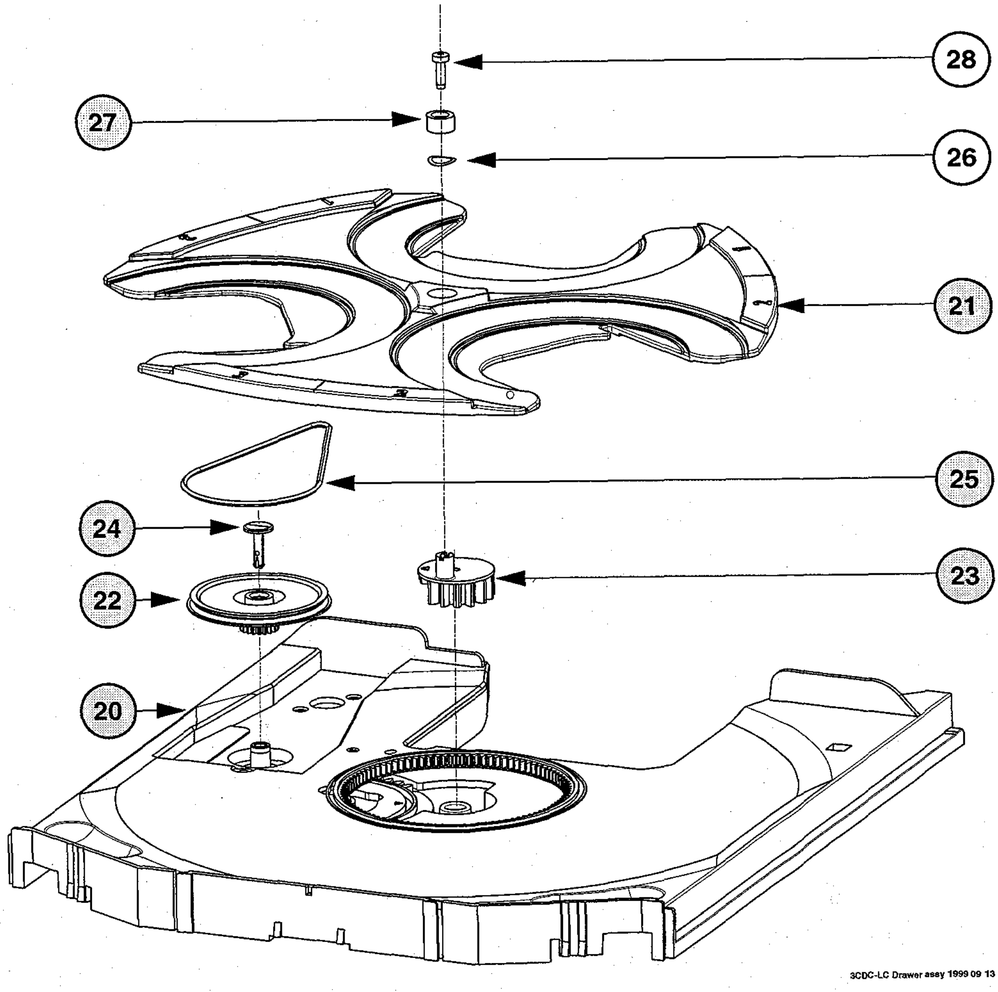
Drawer bottom view

MECHANICAL PARTS ***Drawer***

20	3103 304 66500	DRAWER BLACK
21	3103 304 66490	CAROUSEL BLACK
22	3103 304 06860	PULLEY-DRAWER
23	3103 304 06850	ECCENTRIC GEAR WHEEL
24	3103 304 06980	NAIL FIXATION
25	3103 304 66850	DRIVING BELT CAROUSEL
27	4822 532 12365	BUSH DRAWER (height=5,5mm,d=9,4mm)
29	3103 304 66550	BRACKET-DISC
30	3103 304 66520	TUMBLER
31	3103 301 06470	SPRING-DISC
32	3103 304 06920	CONTROL-DISC
34	3103 304 06870	GEAR-1
37	4822 361 10753	CAROUSEL MOTOR



Drawer top view



Ⓧ spare part

Ⓨ non spare part

3CDC-LC Drawer assy 1999 09 13

ELECTRICAL PARTSLIST 3CDC-LC MODULE

MISCELLANEOUS

37	4822 361 10753	CAROUSEL MOTOR
55	4822 361 10753	TRAY MOTOR
1800	2422 025 17389	FFC-CONNECTOR 16Pin
1805	4822 265 10979	FFC-CONNECTOR 15Pin
1875	4822 267 10958	FFC-CONNECTOR 5Pin
1876	2422 025 08332	FFC-CONNECTOR 5Pin
1880	4822 276 13503	SWITCH
1881	4822 276 13503	SWITCH
1882	4822 276 13503	SWITCH
1883	4822 276 13503	SWITCH
8001	3103 308 93070	FLEX FOIL CABLE 19P, 170mm BD
8002	3103 308 91990	FLEXFOIL CABLE, 5P, 200mm AD
8005	3103 308 92930	FLEX FOIL CABLE 16P 170mm 1:n

CAPACITORS

2800©	4822 122 33753	150pF	5%	50V
2801©	4822 126 13883	220pF	5%	50V
2802©	4822 122 33753	150pF	5%	50V
2803©	4822 126 13883	220pF	5%	50V
2804©	4822 126 13193	4,7nF	10%	63V
2805©	4822 126 13883	220pF	5%	50V
2806©	4822 126 13883	220pF	5%	50V
2807©	4822 126 14241	330pF		50V
2808©	4822 126 13883	220pF	5%	50V
2809©	4822 126 13879	220nF	20%	16V
2810©	4822 126 14508	180pF	5%	50V
2811©	4822 126 13883	220pF	5%	50V
2812©	3198 024 44730	47nF	5%	50V
2813©	4822 122 33177	10nF	20%	50V
2814©	4822 126 14247	1,5nF	10%	50V
2815©	4822 126 14076	220nF	20%	25V
2816©	4822 126 13344	1,5nF	5%	63V
2817	4822 124 40769	4,7µF	20%	100V
2818©	4822 126 13344	1,5nF	5%	63V
2819	4822 124 40769	4,7µF	20%	100V
2820©	5322 126 11578	1nF	10%	63V
2821	4822 124 42383	220µF	20%	4V
2822©	4822 126 14238	2,2nF	10%	50V
2823©	4822 126 11785	47pF	5%	50V
2824©	5322 122 32654	22nF	10%	63V
2826	4822 124 12362	47µF	20%	4V
2827©	4822 122 33753	150pF	5%	50V
2828	4822 124 12362	47µF	20%	4V
2829©	4822 126 11669	27pF	10%	50V
2832	4822 124 40433	47µF	20%	25V
2833©	2222 867 15339	33pF	5%	50V
2835©	3198 024 44730	47nF	5%	50V
2836	4822 124 40769	4,7µF	20%	100V
2837	4822 124 22726	4,7µF	20%	35V
2838	4822 124 40248	10µF	20%	63V
2839	4822 124 40433	47µF	20%	25V
2840©	4822 126 14585	100nF	10%	50V
2841©	4822 122 33216	270pF	5%	50V
2842©	4822 126 14238	2,2nF	10%	50V
2843©	4822 126 14585	100nF	10%	50V
2844©	4822 122 33216	270pF	5%	50V
2848©	4822 122 33753	150pF	5%	50V
2860©	4822 126 14494	22nF	10%	25V
2861	4822 124 11947	10µF	20%	16V
2862©	4822 126 13883	220pF	5%	50V
2863©	4822 126 13883	220pF	5%	50V
2865©	5322 122 32654	22nF	10%	63V
2866©	4822 126 13751	47nF	10%	50V

CAPACITORS

2867©	4822 126 13883	220pF	5%	50V
2868©	2020 552 94427	100pF	5%	50V
2869©	2020 552 94427	100pF	5%	50V
2872©	3198 024 44730	47nF	5%	50V
2873	4822 124 80231	47µF	20%	16V
2876	4822 124 12245	220µF	20%	16V
2877©	4822 126 14226	82pF		50V
2878©	4822 126 13883	220pF	5%	50V
2879	4822 124 12245	220µF	20%	16V
2880	4822 124 11947	10µF	20%	16V
2881	4822 124 40769	4,7µF	20%	100V
2882©	4822 126 13883	220pF	5%	50V
2888	4822 124 11947	10µF	20%	16V

RESISTORS

3713©	4822 051 30223	22kΩ	5%	0,06W
3714©	4822 051 30103	10kΩ	5%	0,06W
3715©	4822 117 13632	100kΩ	1%	0,06W
3719©	4822 051 30392	3,9kΩ	5%	0,06W
3723©	4822 051 20273	27kΩ	5%	0,1W
3730©	4822 051 20333	33kΩ	5%	0,1W
3736©	4822 117 12925	47kΩ	1%	0,06W
3738©	4822 051 30271	270Ω	5%	0,06W
3740©	4822 051 20223	22kΩ	5%	0,1W
3741©	4822 051 20223	22kΩ	5%	0,1W
3742©	4822 051 20223	22kΩ	5%	0,1W
3743©	4822 051 20223	22kΩ	5%	0,1W
3744©	4822 051 30103	10kΩ	5%	0,06W
3745©	4822 117 10833	10kΩ	1%	0,1W
3746©	4822 051 30103	10kΩ	5%	0,06W
3747©	4822 117 12925	47kΩ	1%	0,06W
3748©	4822 051 30103	10kΩ	5%	0,06W
3750©	4822 051 30102	1kΩ	5%	0,06W
3751©	4822 051 30102	1kΩ	5%	0,06W
3752©	4822 117 13632	100kΩ	1%	0,06W
3753©	4822 117 13632	100kΩ	1%	0,06W
3754©	4822 051 30221	220Ω	5%	0,06W
3755©	4822 117 11503	220Ω	5%	0,1W
3757©	4822 117 11373	100Ω	1%	0,1W
3758©	4822 051 30101	100Ω	5%	0,06W
3760©	4822 117 10833	10kΩ	1%	0,1W
3761©	4822 051 30103	10kΩ	5%	0,06W
3762©	4822 051 30223	22kΩ	5%	0,06W
3763©	4822 051 30223	22kΩ	5%	0,06W
3764©	4822 117 11373	100Ω	1%	0,1W
3765©	4822 051 30103	10kΩ	5%	0,06W
3766©	4822 117 10833	10kΩ	1%	0,1W
3767©	4822 051 30339	33Ω	5%	0,06W
3769©	4822 051 30101	100Ω	5%	0,06W
3770©	4822 051 30102	1kΩ	5%	0,06W
3771©	4822 051 30102	1kΩ	5%	0,06W
3772©	4822 051 30471	470Ω	5%	0,06W
3773©	4822 117 10833	10kΩ	1%	0,1W
3774©	4822 117 11373	100Ω	1%	0,1W
3775⚠	4822 052 10338	3,3Ω	5%	NFR25
3776©	4822 051 30103	10kΩ	5%	0,06W
3800©	4822 051 30273	27kΩ	5%	0,06W
3801©	4822 117 10833	10kΩ	1%	0,1W
3802©	4822 051 30273	27kΩ	5%	0,06W
3803©	4822 117 10833	10kΩ	1%	0,1W
3805©	4822 051 30103	10kΩ	5%	0,06W
3806©	4822 051 30103	10kΩ	5%	0,06W
3807©	4822 051 30103	10kΩ	5%	0,06W
3808©	4822 051 30103	10kΩ	5%	0,06W

ELECTRICAL PARTSLIST 3CDC-LC MODULE

RESISTORS

3810©	4822 051 30471	470Ω	5%	0,06W
3811©	4822 051 30273	27kΩ	5%	0,06W
3812©	4822 051 20471	470Ω	5%	0,1W
3813©	4822 051 20471	470Ω	5%	0,1W
3814©	4822 051 20471	470Ω	5%	0,1W
3815▲	4822 052 10478	4,7Ω	5%	NFR25
3816©	4822 051 20471	470Ω	5%	0,1W
3817©	4822 051 30471	470Ω	5%	0,06W
3818©	4822 051 30471	470Ω	5%	0,06W
3819©	4822 051 20471	470Ω	5%	0,1W
3820©	4822 051 30332	3,3kΩ	5%	0,06W
3821©	4822 051 30332	3,3kΩ	5%	0,06W
3822©	4822 051 20332	3,3kΩ	5%	0,1W
3823©	4822 051 30102	1kΩ	5%	0,06W
3824©	4822 051 30102	1kΩ	5%	0,06W
3825©	4822 051 10102	1kΩ	2%	0,25W
3826©	4822 051 30223	22kΩ	5%	0,06W
3827©	4822 051 20273	27kΩ	5%	0,1W
3829©	4822 117 13608	4,7Ω	5%	0,06W
3830©	4822 051 20223	22kΩ	5%	0,1W
3833©	4822 051 30223	22kΩ	5%	0,06W
3834©	4822 051 30223	22kΩ	5%	0,06W
3835▲	4822 052 10338	3,3Ω	5%	NFR25
3836©	4822 117 12903	1,8kΩ	1%	0,06W
3837©	4822 051 10102	1kΩ	2%	0,25W
3838©	4822 051 30102	1kΩ	5%	0,06W
3839©	4822 117 13632	100kΩ	1%	0,06W
3840©	4822 051 20471	470Ω	5%	0,1W
3842©	4822 117 10834	47kΩ	1%	0,1W
3843©	4822 051 20333	33kΩ	5%	0,1W
3844©	4822 051 30472	4,7kΩ	5%	0,06W
3845©	4822 117 10834	47kΩ	1%	0,1W
3846©	4822 051 20333	33kΩ	5%	0,1W
3847©	4822 051 30682	6,8kΩ	5%	0,06W
3848©	3198 021 52240	220kΩ	5%	0,1W
3849©	4822 051 30472	4,7kΩ	5%	0,06W
3850©	4822 051 30682	6,8kΩ	5%	0,06W
3853©	4822 051 20471	470Ω	5%	0,1W
3854©	4822 117 11373	100Ω	1%	0,1W
3855©	4822 117 12971	15Ω	5%	0,06W
3856©	4822 117 12521	68Ω	1%	0,1W
3857©	4822 117 12521	68Ω	1%	0,1W
3861©	4822 051 30103	10kΩ	5%	0,06W
3862©	4822 051 20121	120Ω	5%	0,1W
3863©	4822 051 30339	33Ω	5%	0,06W
3864©	4822 051 30101	100Ω	5%	0,06W
3865©	4822 051 30121	120Ω	5%	0,06W
3866©	4822 051 30103	10kΩ	5%	0,06W
3871©	4822 051 20683	68kΩ	5%	0,1W
3872©	4822 051 30472	4,7kΩ	5%	0,06W
3878©	4822 117 11503	220Ω	5%	0,1W
3880▲	4822 052 10338	3,3Ω	5%	NFR25
3881©	4822 117 11503	220Ω	5%	0,1W
3882©	4822 117 10837	100kΩ	1%	0,1W
3883©	4822 051 10102	1kΩ	2%	0,25W
3890©	4822 051 30332	3,3kΩ	5%	0,06W
3891©	4822 051 30472	4,7kΩ	5%	0,06W
4700©	4822 051 20008	CHIP JUMPER 0805		
4701©	4822 051 20008	CHIP JUMPER 0805		
4702©	4822 051 20008	CHIP JUMPER 0805		
4703©	4822 051 20008	CHIP JUMPER 0805		
4704©	4822 051 20008	CHIP JUMPER 0805		
4705©	4822 051 20008	CHIP JUMPER 0805		
4706©	4822 051 20008	CHIP JUMPER 0805		

RESISTORS

4707©	4822 051 20008	CHIP JUMPER 0805
4708©	4822 051 20008	CHIP JUMPER 0805
4709©	4822 051 20008	CHIP JUMPER 0805
4710©	4822 051 20008	CHIP JUMPER 0805
4711©	4822 051 20008	CHIP JUMPER 0805
4712©	4822 051 20008	CHIP JUMPER 0805
4713©	4822 051 20008	CHIP JUMPER 0805
4714©	4822 051 20008	CHIP JUMPER 0805
4715©	4822 051 20008	CHIP JUMPER 0805
4716©	4822 051 20008	CHIP JUMPER 0805
4717©	4822 051 30008	CHIP JUMPER 0603
4718©	4822 051 20008	CHIP JUMPER 0805
4719©	4822 051 20008	CHIP JUMPER 0805
4720©	4822 051 20008	CHIP JUMPER 0805
4722©	4822 051 20008	CHIP JUMPER 0805
4724©	4822 051 20008	CHIP JUMPER 0805
4726©	4822 051 20008	CHIP JUMPER 0805
4727©	4822 051 20008	CHIP JUMPER 0805
4728©	4822 051 20008	CHIP JUMPER 0805
4729©	4822 051 20008	CHIP JUMPER 0805
4730©	4822 051 20008	CHIP JUMPER 0805
4731©	4822 051 30008	CHIP JUMPER 0603
4732©	4822 051 20008	CHIP JUMPER 0805
4733©	4822 051 30008	CHIP JUMPER 0603
4734©	4822 051 20008	CHIP JUMPER 0805
4735©	4822 051 20008	CHIP JUMPER 0805
4736©	4822 051 30008	CHIP JUMPER 0603
4737©	4822 051 30008	CHIP JUMPER 0603
4738©	4822 051 30008	CHIP JUMPER 0603
4739©	4822 051 30008	CHIP JUMPER 0603
4740©	4822 051 30008	CHIP JUMPER 0603
4741©	4822 051 20008	CHIP JUMPER 0805
4742©	4822 051 20008	CHIP JUMPER 0805
4743©	4822 051 20008	CHIP JUMPER 0805
4744©	4822 051 30008	CHIP JUMPER 0603
4745©	4822 051 20008	CHIP JUMPER 0805
4746©	4822 051 20008	CHIP JUMPER 0805
4747©	4822 051 20008	CHIP JUMPER 0805
4748©	4822 051 20008	CHIP JUMPER 0805
4749©	4822 051 30008	CHIP JUMPER 0603
4801©	4822 051 20008	CHIP JUMPER 0805
4804©	4822 051 20008	CHIP JUMPER 0805
4806©	4822 051 20008	CHIP JUMPER 0805
4807©	4822 051 20008	CHIP JUMPER 0805
4808©	4822 051 20008	CHIP JUMPER 0805
4809©	4822 051 20008	CHIP JUMPER 0805
4810©	4822 051 20008	CHIP JUMPER 0805
4811©	4822 051 20008	CHIP JUMPER 0805
4820©	4822 051 20008	CHIP JUMPER 0805
4823©	4822 051 30008	CHIP JUMPER 0603
4824©	4822 051 30008	CHIP JUMPER 0603
4825©	4822 051 20008	CHIP JUMPER 0805
4826©	4822 051 20008	CHIP JUMPER 0805
4828©	4822 051 30008	CHIP JUMPER 0603
4829©	4822 051 20008	CHIP JUMPER 0805
4830©	4822 051 20008	CHIP JUMPER 0805
4831©	4822 051 20008	CHIP JUMPER 0805
4832©	4822 051 30008	CHIP JUMPER 0603
4833©	4822 051 20008	CHIP JUMPER 0805
4834©	4822 051 20008	CHIP JUMPER 0805
4837©	4822 051 20008	CHIP JUMPER 0805
4838©	4822 051 30008	CHIP JUMPER 0603
4839©	4822 051 20008	CHIP JUMPER 0805
4840©	4822 051 20008	CHIP JUMPER 0805

ELECTRICAL PARTSLIST 3CDC-LC MODULE

RESISTORS

4841 ©	4822 051 20008	CHIP JUMPER 0805
4842 ©	4822 051 20008	CHIP JUMPER 0805
4844 ©	4822 051 20008	CHIP JUMPER 0805
4845 ©	4822 051 20008	CHIP JUMPER 0805
4846 ©	4822 051 20008	CHIP JUMPER 0805
4847 ©	4822 051 20008	CHIP JUMPER 0805
4848 ©	4822 051 20008	CHIP JUMPER 0805
4849 ©	4822 051 30008	CHIP JUMPER 0603
4851 ©	4822 051 30008	CHIP JUMPER 0603
4855 ©	4822 051 20008	CHIP JUMPER 0805
4856 ©	4822 051 20008	CHIP JUMPER 0805
4857 ©	4822 051 20008	CHIP JUMPER 0805
4858 ©	4822 051 20008	CHIP JUMPER 0805
4868 ©	4822 051 20008	CHIP JUMPER 0805
4869 ©	4822 051 20008	CHIP JUMPER 0805
4870 ©	4822 051 20008	CHIP JUMPER 0805
4871 ©	4822 051 20008	CHIP JUMPER 0805
4872 ©	4822 051 20008	CHIP JUMPER 0805
4873 ©	4822 051 20008	CHIP JUMPER 0805
4874 ©	4822 051 20008	CHIP JUMPER 0805
4875 ©	4822 051 20008	CHIP JUMPER 0805
4876 ©	4822 051 20008	CHIP JUMPER 0805
4878 ©	4822 051 20008	CHIP JUMPER 0805
4879 ©	4822 051 20008	CHIP JUMPER 0805
4880 ©	4822 051 20008	CHIP JUMPER 0805
4882 ©	4822 051 20008	CHIP JUMPER 0805
4883 ©	4822 051 20008	CHIP JUMPER 0805
4884 ©	4822 051 20008	CHIP JUMPER 0805
4885 ©	4822 051 20008	CHIP JUMPER 0805
4886 ©	4822 051 20008	CHIP JUMPER 0805
4887 ©	4822 051 30008	CHIP JUMPER 0603
4888 ©	4822 051 20008	CHIP JUMPER 0805
4889 ©	4822 051 20008	CHIP JUMPER 0805
4890 ©	4822 051 20008	CHIP JUMPER 0805
4891 ©	4822 051 30008	CHIP JUMPER 0603
4892 ©	4822 051 20008	CHIP JUMPER 0805
4893 ©	4822 051 20008	CHIP JUMPER 0805
4894 ©	4822 051 20008	CHIP JUMPER 0805
4895 ©	4822 051 20008	CHIP JUMPER 0805
4896 ©	4822 051 20008	CHIP JUMPER 0805
4897 ©	4822 051 20008	CHIP JUMPER 0805
4898 ©	4822 051 20008	CHIP JUMPER 0805
4899 ©	4822 051 20008	CHIP JUMPER 0805

COILS

1810	2422 540 98519	RESONATOR 8,467MHz

DIODES

6801 ©	4822 130 11397	BAS316
6802 ©	4822 130 11397	BAS316
6803 ©	4822 130 11397	BAS316
6804 ©	4822 130 11397	BAS316
6805 ©	9340 548 52115	BZX284-C5V1
6807 ©	9322 129 34685	BZX284-C3V9
6808 ©	4822 130 11397	BAS316
6809 ©	9322 129 34685	BZX284-C3V9

TRANSISTORS

7806 ©	5322 130 60159	BC846B
7812 ©	5322 130 60159	BC846B
7815 ©	5322 130 60159	BC846B

INTEGRATED CIRCUITS

7801 ©	9352 622 36118	TZA1025T/V2 HF-Amplifier
7802 ©	9352 641 80557	SAA7324H/M2B,"CD10" SIGN.PROC.
7803	4822 209 32852	TDA7073A/N2
7807	4822 209 32852	TDA7073A/N2
7811 ©	4822 209 33165	TDA1308T/N1
7813 ©	5322 209 11306	HEF4094BT, SHIFT REGISTER
7814	4822 209 32852	TDA7073A/N2

ELECTRICAL PARTSLIST MP3CD2002 MODULE

MISCELLANEOUS

	3103 308 67020	**complete MP3CD2002 Module**
1451	2422 025 17303	FLEX FOIL CONNECTOR 19P

CAPACITORS

2450©	2238 586 59812	100nF	10%	50V
2451©	3198 017 41050	1µF	20%	10V
2452©	3198 017 41050	1µF	20%	10V
2453©	2238 586 59812	100nF	10%	50V
2454©	2238 586 59812	100nF	10%	50V
2455©	2238 586 59812	100nF	10%	50V
2456©	2238 586 59812	100nF	10%	50V
2457©	5322 126 11583	10nF	10%	63V
2458©	5322 126 11583	10nF	10%	63V
2459©	3198 017 41050	1µF	20%	10V
2460©	2238 586 59812	100nF	10%	50V
2461©	4822 124 81059	220µF	20%	4V
2462©	3198 017 41050	1µF	20%	10V
2463©	3198 017 41050	1µF	20%	10V
2464©	2238 586 59812	100nF	10%	50V
2465©	2238 586 59812	100nF	10%	50V
2466©	2238 586 59812	100nF	10%	50V
2467©	3198 017 41050	1µF	20%	10V
2468©	3198 017 41050	1µF	20%	10V
2469©	2238 586 59812	100nF	10%	50V
2470©	2238 586 59812	100nF	10%	50V
2471©	2238 586 59812	100nF	10%	50V

RESISTORS

3449©	4822 051 30101	100Ω	5%	0,06W
3450©	4822 117 12971	15Ω	5%	0,06W
3451©	4822 117 12971	15Ω	5%	0,06W
3452©	4822 051 30101	100Ω	5%	0,06W
3453©	4822 051 30109	10Ω	5%	0,06W
3454©	4822 117 12971	15Ω	5%	0,06W
3455©	4822 051 30102	1kΩ	5%	0,06W
3456©	4822 051 30102	1kΩ	5%	0,06W
3457©	5322 117 13051	680Ω	1%	0,063W
3458©	5322 117 13061	180Ω	1%	0,063W
3459©	4822 051 30221	220Ω	5%	0,06W
3460©	4822 051 30102	1kΩ	5%	0,06W
3461©	4822 051 30479	47Ω	5%	0,06W
3462©	4822 051 30101	100Ω	5%	0,06W
3463©	4822 051 30101	100Ω	5%	0,06W
3464©	4822 051 30103	10kΩ	5%	0,06W
3465©	4822 051 30101	100Ω	5%	0,06W
3466©	4822 051 30471	470Ω	5%	0,06W
3467©	4822 051 30103	10kΩ	5%	0,06W
3468©	4822 051 30103	10kΩ	5%	0,06W
3469©	4822 051 30101	100Ω	5%	0,06W
3470©	4822 117 12971	15Ω	5%	0,06W
3471©	4822 051 30339	33Ω	5%	0,06W
3472©	4822 051 30154	150kΩ	5%	0,06W
3473©	4822 117 13632	100kΩ	1%	0,06W

RESISTORS

3474©	4822 117 12971	15Ω	5%	0,06W
3475©	4822 051 30101	100Ω	5%	0,06W
3476©	4822 051 30101	100Ω	5%	0,06W
3477©	4822 051 30471	470Ω	5%	0,06W
3478©	4822 051 30471	470Ω	5%	0,06W
3479©	4822 051 30471	470Ω	5%	0,06W
3480©	4822 051 30101	100Ω	5%	0,06W
3481©	4822 051 30101	100Ω	5%	0,06W
3482©	4822 051 30471	470Ω	5%	0,06W
3483©	4822 051 30101	100Ω	5%	0,06W
3484©	4822 117 12971	15Ω	5%	0,06W
3486©	4822 051 30101	100Ω	5%	0,06W
3488©	4822 117 13632	100kΩ	1%	0,06W
3489©	4822 051 30103	10kΩ	5%	0,06W
3490©	4822 051 30101	100Ω	5%	0,06W
3491©	4822 051 30479	47Ω	5%	0,06W
3492©	4822 051 30105	1MΩ	5%	0,06W
3493©	4822 051 30103	10kΩ	5%	0,06W
3494©	4822 051 30103	10kΩ	5%	0,06W
3495©	4822 051 30103	10kΩ	5%	0,06W
3497©	4822 051 30103	10kΩ	5%	0,06W
3498©	4822 051 30332	3,3kΩ	5%	0,06W
3499©	4822 051 30103	10kΩ	5%	0,06W
4450©	4822 051 30008	CHIP JUMPER 0603		

COILS

1460	4822 242 10989	CER.RES. 16,9MHz
5450©	4822 157 11074	100µH

DIODES

6450©	4822 130 11411	BZX284-C3V3
6451©	4822 130 11366	BZX284-C3V9
7454	4822 130 34174	BZX79-B4V7

TRANSISTORS

7452©	3198 010 42310	BC847BW
7453©	3198 010 42310	BC847BW
7456©	3198 010 42310	BC847BW
7460©	3198 010 42310	BC847BW

INTEGRATED CIRCUITS

7450©	not available	please order complete MP3 module
7451©	not available	please order complete MP3 module
7455©	4822 209 17108	LM317LD Voltage Regulator
7457©	9352 456 50115	HC1G04, Inverter
7458©	9322 130 41668	M24C64, EEPROM
	3103 308 67020	**complete MP3CD2002 Module**

AF12 BOARD

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BRIEF INTRODUCTION OF THE AF12 BOARD

The AF12 Board consists of the following features :

a. TDA7468D IC

TDA7468D IC (7501) which includes functions such as source selection, loudness control, dynamic bass control, treble control, volume control and muting function. Sound features such as ALC, DBB, DSC and IS are controllable via I^2C Bus from the microprocessor.

The TDA7468D IC caters for 4 input sources namely TUNER, PC LINK, CD and AUX. It also has a Mic mix input. In our application, software will switch the input source to previous source MUTE during STANDBY mode and some other occasions where noise from other input sources is undesirable.

Note that the input to the TDA7468D IC must be ac coupled to prevent 'polp' noise.
Input networks are included to provide appropriate attenuation for various sources.

b. SIMPLE MIC MIXING

The AF12 Board has provisions which can be configured to cater for one of the following:
MM : which caters for Mic mixing with additional Mic amplifier board.
NM : non Mic mixing.

c. LINE OUT

Line out cinch socket for connection to external amplifier.

d. SUB-WOOFER OUT

Sub-woofer out cinch socket for connection to active sub-woofer speaker.

e. INCREDIBLE SURROUND

Incredible surround effect using transistor circuit to create phase shifting and spatial effect.

f. HEADPHONE AMPLIFIER

Headphone amplifier to drive 32 ohm to 1kohm headphone.

g. CD STANDBY CONTROL

CD Standby Control circuit which switches on the supply to CD servo control IC, digital out buffer IC, HF circuit and the laser light pen in CD mode only.

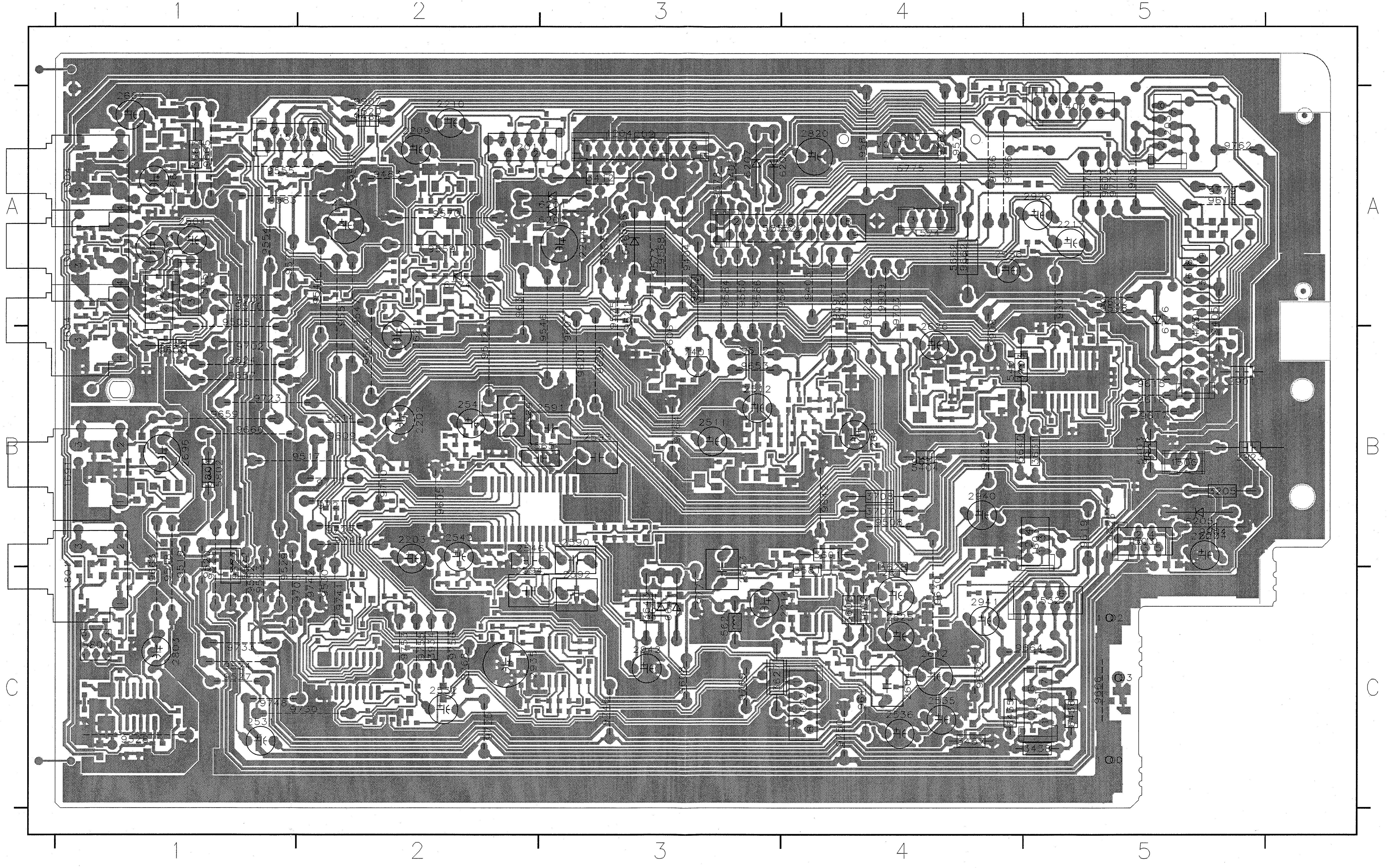
h. ATTENUATION NETWORK

Attenuation network is provided at the output of the AF12 Board for interfacing with power board of different output power.

i. CD DIGITAL OUT

CD Digital out cinch socket for connection to external digital audio decoders.

AF12 BOARD - COMPONENT LAYOUT



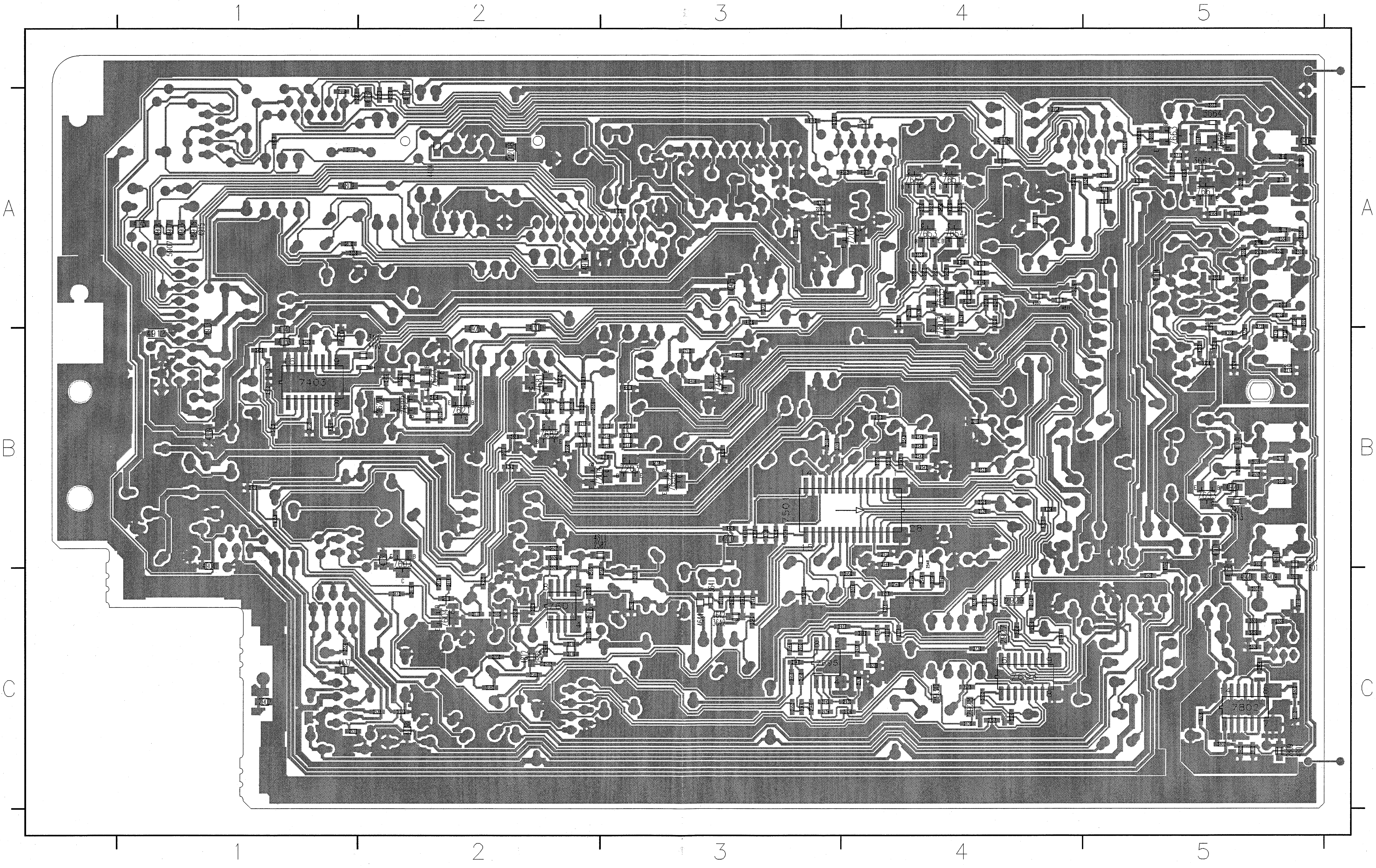
AF12 BOARD - COMPONENT LAYOUT (MAPPING)

1100	C5
1102	C5
1103	C5
1201	A2
1202	A3
1203	A5
1204	A3
1401	A5
1402	A5
1405	B5
1501	A1
1502	A1
1503	B5
1504	A1
1505	A1
1506	B5
1510	B5
1520	A1
1522	A4
1523	A3
1524	A4
1525	A3
1531	C5
1532	C5
1603	B5
1604	B1
1691	B1
1692	C4
1801	C1
2201	A2
2202	B2
2203	B2
2204	A3
2207	B5
2209	A2
2210	A2
2214	C4
2217	A5
2503	A1
2504	A1
2511	B3
2512	B3
2520	A2
2531	C1
2532	C2
2535	C4
2536	C4
2541	B2
2542	B2
2546	B2
2565	B3
2589	B2
2590	B3
2591	B3
2592	C3
2593	B3
2594	C2
2603	C3
2604	C4
2611	C4
2612	C4
2621	B2
2625	C4
2626	B4
2661	A1
2662	A1
2681	B4
2696	B1
2803	C1
2820	A4
2901	B5
2923	B5
2926	A5
2935	C2
2940	B4
2941	C4
2942	C3
2956	A4
3205	B5
3403	B4
3410	A3
3412	A3
3435	C4
3436	C5
3437	C4
3438	C5
3581	C4
3601	B4
3602	C4
3608	C4
3627	C3
3628	B4
3631	B5
3640	B4
3643	C3
3663	A1
3707	B4
3708	B4
3722	B1
3804	B1
3934	C2
5401	B4
5403	B5
5404	B4
5522	B1
5621	C3
5662	A4
5801	C1
5802	B1
6201	A3
6202	A3
6204	B5
6205	B5
6207	A3
6208	A4
6401	A3
6641	C3
6642	C3
6774	A2
6775	A4
6776	A5
7401	B3
9401	A3
9402	A3
9403	A4
9404	A3
9405	A5
9483	A2
9486	A2
9505	A1
9508	B4
9510	A1
9512	B2
9514	B2
9517	B2
9518	C1
9519	B1
9520	B1
9521	B1
9522	B1
9523	C1
9524	C1
9527	C1
9528	C1
9529	B1
9530	C2
9544	A2
9546	B3
9547	A2
9548	B2
9550	A3
9551	A2
9552	C1
9554	A1
9555	A1
9557	A2
9559	A2
9564	A3
9566	A3
9568	A3
9570	A2
9573	A3
9575	A3
9576	A4
9577	A1
9578	A3
9579	A5
9581	A4
9582	A4
9583	A1
9584	A3
9586	A3
9587	A4
9591	A4
9596	A4
9598	A5
9600	B1
9601	A5
9602	A5
9603	A5
9605	B2
9606	B3
9607	B3
9608	C3
9609	B2
9612	B3
9613	A5
9615	B5
9616	B5
9617	B5
9618	B5
9619	B5
9620	B3
9621	A3
9623	B5
9624	B1
9626	B4
9628	A4
9629	B3
9630	C4
9631	A2
9632	C4
9641	C4
9642	B4
9651	A5
9653	B3
9654	B4
9657	B1
9659	B1
9660	B1
9662	A4
9663	C1
9664	C5
9665	A1
9666	C5
9701	A1
9702	B1
9703	A4
9705	C2
9710	B2
9717	B2
9721	B2
9723	B1
9725	C2
9729	B2
9730	C2
9733	C1
9741	C2
9742	C2
9743	B2
9746	C3
9748	C1
9750	C4
9753	C2
9755	C2
9756	C2
9762	A5
9764	B3
9765	A4
9766	A4
9768	C2
9769	C3
9771	C3
9772	A5
9773	A5
9904	B5
9907	A2
9908	B4
9909	A4

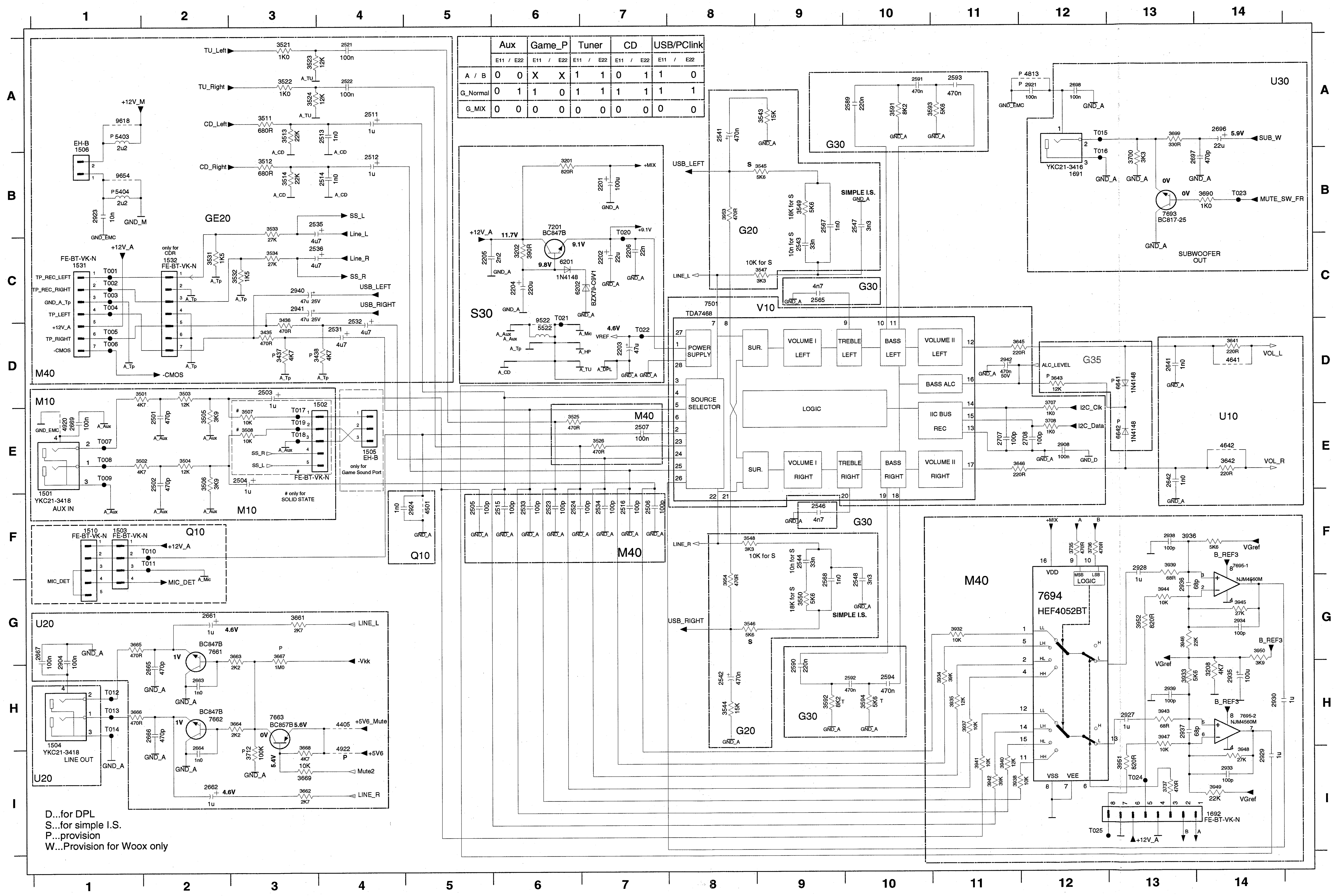
AF12 BOARD - CHIP LAYOUT (MAPPING)

2205	A3
2206	B4
2208	A2
2212	B5
2213	B5
2215	B2
2216	B3
2401	B1
2402	B1
2403	B1
2404	B2
2501	A5
2502	A5
2505	C4
2506	C4
2507	C5
2513	B3
2514	B3
2515	B4
2516	B4
2521	A5
2522	A4
2523	B4
2524	C4
2533	B4
2534	C4
2543	B4
2544	C4
2547	B4
2548	B4
2567	B4
2568	C4
2581	C3
2582	C2
2583	C3
2584	C2
2585	C2
2586	C2
2587	B3
2588	C2
2601	C3
2602	C3
2605	C2
2606	C2
2607	B2
2608	C2
2609	B2
2610	C2
2620	B2
2622	B2
2624	C3
2641	C3
2642	C3
2653	A4
2654	A4
2663	A5
2664	A5
2665	A5
2666	A5
2667	A5
2669	A5
2682	B2
2683	B2
2691	A4
2697	B5
2698	B5
2707	B3
2708	B3
2801	C5
2802	C5
2804	C5
2805	C5
2806	C5
2807	C5
2808	C5
2809	C5
2810	C5
2902	C1
2904	A5
2905	C2
2908	A3
2921	B5
2922	B1
2924	B5
2925	A5
2927	C4
2928	C4
2929	C4
2930	C4
2933	C3
2934	C3
2936	C4
2937	C4
2938	C4
2939	C4
2950	A1
2951	A1
2952	A2
2953	A2
2954	A4
2955	B1
3201	A4
3202	A3
3203	B2
3204	B2
3206	B2
3207	B2
3208	C4
3401	B1
3402	B1
3406	B2
3408	B3
3409	B3
3501	A5
3502	A5
3503	A5
3504	A5
3505	A5
3506	A5
3507	A5
3508	A5
3511	B3
3512	B3
3513	B3
3514	B3
3521	A5
3522	A5
3523	A5
3524	A5
3525	B4
3526	B4
3531	C1
3532	C2
3533	C2
3534	C1
3543	B4
3544	B4
3545	B4
3546	C4
3547	B4
3548	C4
3549	B4
3550	C4
3582	C2
3591	B3
3592	C3
3593	B3
3594	C4
3607	B2
3609	B2
3610	C2
3611	C2
3612	C2
3613	C2
3614	C2
3615	C2
3616	C2
3621	B2
3622	B2
3623	B2
3624	B2
3625	B2
3626	B2
3629	C2
3630	A1
3633	A4
3634	A4
3635	B2
3636	A4
3637	B3
3638	A4
3639	A4
3641	C3
3642	C3
3644	A1
3645	B3
3646	C3
3651	A4
3652	A4
3653	A4
3654	A4
3655	A4
3656	A4
3657	A4
3658	A4
3659	C2
3660	C2
3661	A5
3662	A5
3664	A5
3665	A5
3666	A5
3667	A5
3668	A5
3669	A5
3683	B2
3684	B2
3686	B2
3687	B2
3688	B2
3689	B2
3690	B5
3692	B2
3694	B2
3699	B5
3700	B5
3711	B3
3712	A5
3721	A4
3723	A5
3724	B5
3725	B5
3726	A4
3727	B5
3728	A5
3729	B5
3730	A5
3731	A3
3732	B1
3733	A3
3734	A4
3735	C4
3736	C4
3737	C4
3801	C5
3802	C5
3803	C5
3805	C5
3806	B5
3807	C5
3808	C5
3809	C5
3810	A1
3932	C4
3933	C4
3935	C4
3936	C4
3937	C4
3938	C4
3939	C4
3940	C4
3941	C4
3942	C4
3943	C4
3944	C3
3945	C3
3946	C3
3947	C3
3948	C3
3949	C4
3950	C3
3951	C3
3952	C3
3953	B4
3954	C4
4101	B5
4102	A3
4104	A5
4130	B2
4133	B1
4137	C1
4138	C2
4139	B1
4141	B1
4142	A3
4145	A1
4146	A4
4148	A4
4149	B5
4150	C5
4151	A2
4152	A2
4153	B1
4202	B5
4203	A4
4206	B5
4207	A4
4208	A4
4209	A5
4210	B5
4211	A4
4212	B5
4301	A2
4305	B3
4319	C4
4331	C4
4332	C2
4334	B1
4336	B3
4337	B4
4338	B4
4342	B2
4403	B2
4404	A2
4405	A4
4407	B3
4408	B5
4409	B3
4410	B3
4411	B3
4501	B5
4641	C3
4642	C3
4660	A4
4661	A4
4662	A4
4663	A1
4801	C5
4802	A1
4811	B2
4812	C2
4813	B5
4814	A5
4903	A1
4904	B1
4905	A3
4906	A5
4907	A1
4908	A1
4909	C5
4910	B5
4911	B5
4912	B1
4913	B1
4914	A2
4915	A1
4920	B5
4921	C5
4922	A4
4923	A4
4924	A4
4925	B2
4926	A3
4927	C4
5907	A1
5915	A1
7201	A4
7203	B3
7204	B2
7402	B3
7403	B1
7501	B3
7601	C2
7603	B2
7604	C2
7621	B2
7622	B2
7623	B2
7635	A4
7636	B3
7651	A4
7652	A4
7653	A4
7654	A4
7661	A5
7662	A5
7663	A5
7681	B2
7682	B2
7693	B5
7694	C4
7695	C3
7802	C5
7803	A4

AF12 BOARD - CHIP LAYOUT


1
2
3
4
5
A
B
C
7403
7621
7750
7803

AF12 BOARD - CIRCUIT DIAGRAM (PART 1)


1
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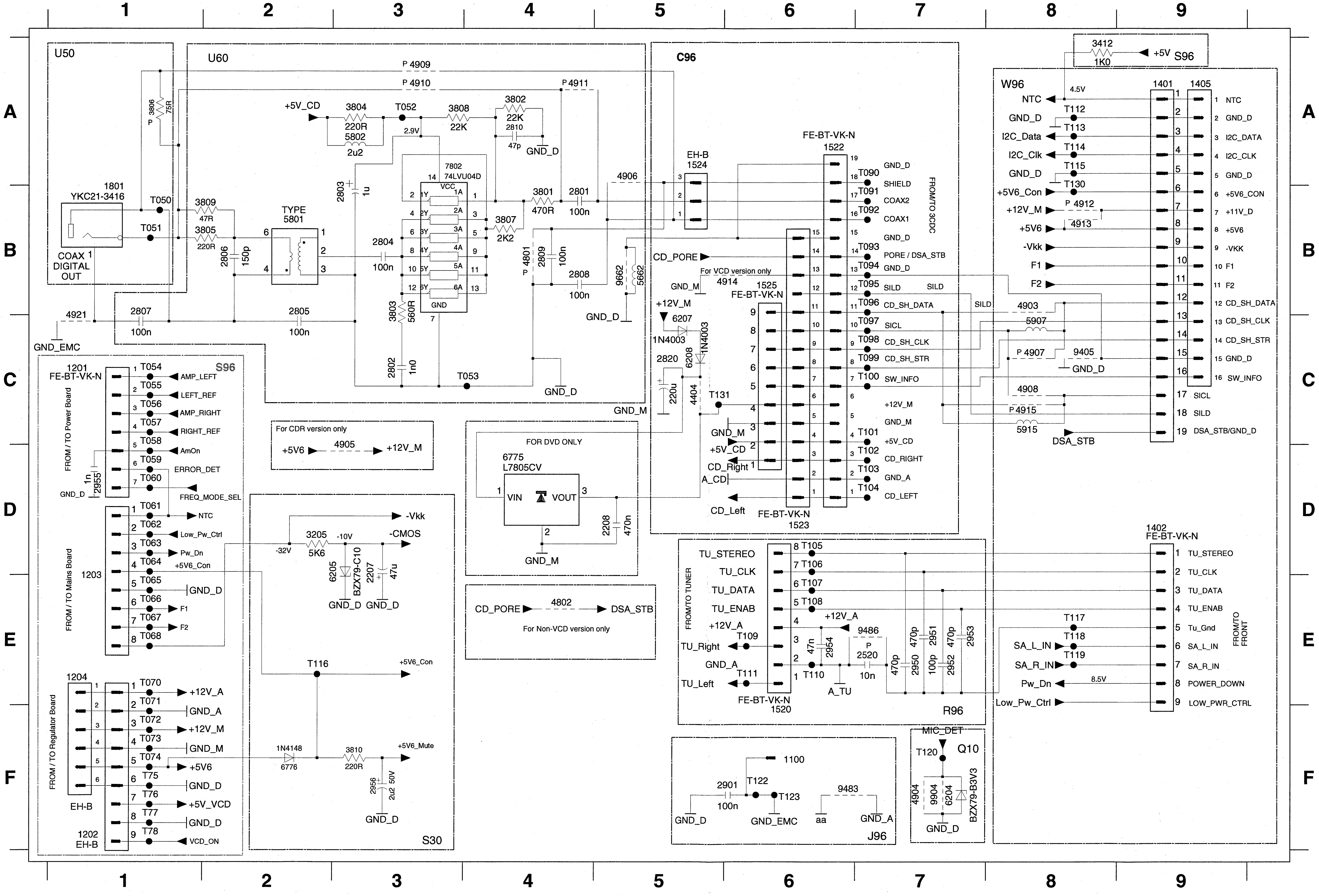
9
10
11
12
13
14
A
B
C
D
E
F
G
H
I
M40
M10
Q10
U20
GE20
S30
V10
G20
G30
G35
U30
U10
TU_Left
TU_Right
CD_Left
CD_Right
+12V_M
EH-B 1506
FE-BT-VK-N 1531
only for CDR 1532 FE-BT-VK-N
TP_REC_LEFT
TP_REC_RIGHT
GND_A_Tp
TP_LEFT
+12V_A
TP_RIGHT
-CMOS
SS_L
Line_L
Line_R
SS_R
USB_LEFT
USB_RIGHT
+MIX
7201 BC847B
7501 TDA7468
POWER SUPPLY
SOURCE SELECTOR
SUR.
VOLUME I LEFT
TREBLE LEFT
BASS LEFT
VOLUME II LEFT
BASS ALC
LOGIC
IIC BUS REC
VOLUME I RIGHT
TREBLE RIGHT
BASS RIGHT
VOLUME II RIGHT
ALC_LEVEL
I2C_Clk
I2C_Data
SIMPLE I.S.
YKC21-3416 1691
SUB_W
MUTE_SW_FR
7693 BC817-25
SUBWOOFER OUT
VOL_L
VOL_R
1501 YKC21-3418 AUX IN
1502
1505 EH-B only for Game Sound Port
# only for SOLID STATE
1510 FE-BT-VK-N
1503 FE-BT-VK-N
MIC_DET
7694 HEF4052BT
7695-1 NJM4560M
7695-2 NJM4560M
B_REF3
VGref
1692 FE-BT-VK-N
BC847B 7661
BC847B 7662
7663 BC857B
LINE_L
LINE_R
-Vkk
+5V6_Mute
+5V6
Mute2
1504 YKC21-3418 LINE OUT

	Aux		Game_P		Tuner		CD		USB/PClink	
	E11	E22	E11	E22	E11	E22	E11	E22	E11	E22
A / B	0	0	X	X	1	1	0	1	1	0
G_Normal	0	1	1	0	1	1	1	1	1	1
G_MIX	0	0	0	0	0	0	0	0	0	0

D...for DPL
S...for simple I.S.
P...provision
W...Provision for Woox only

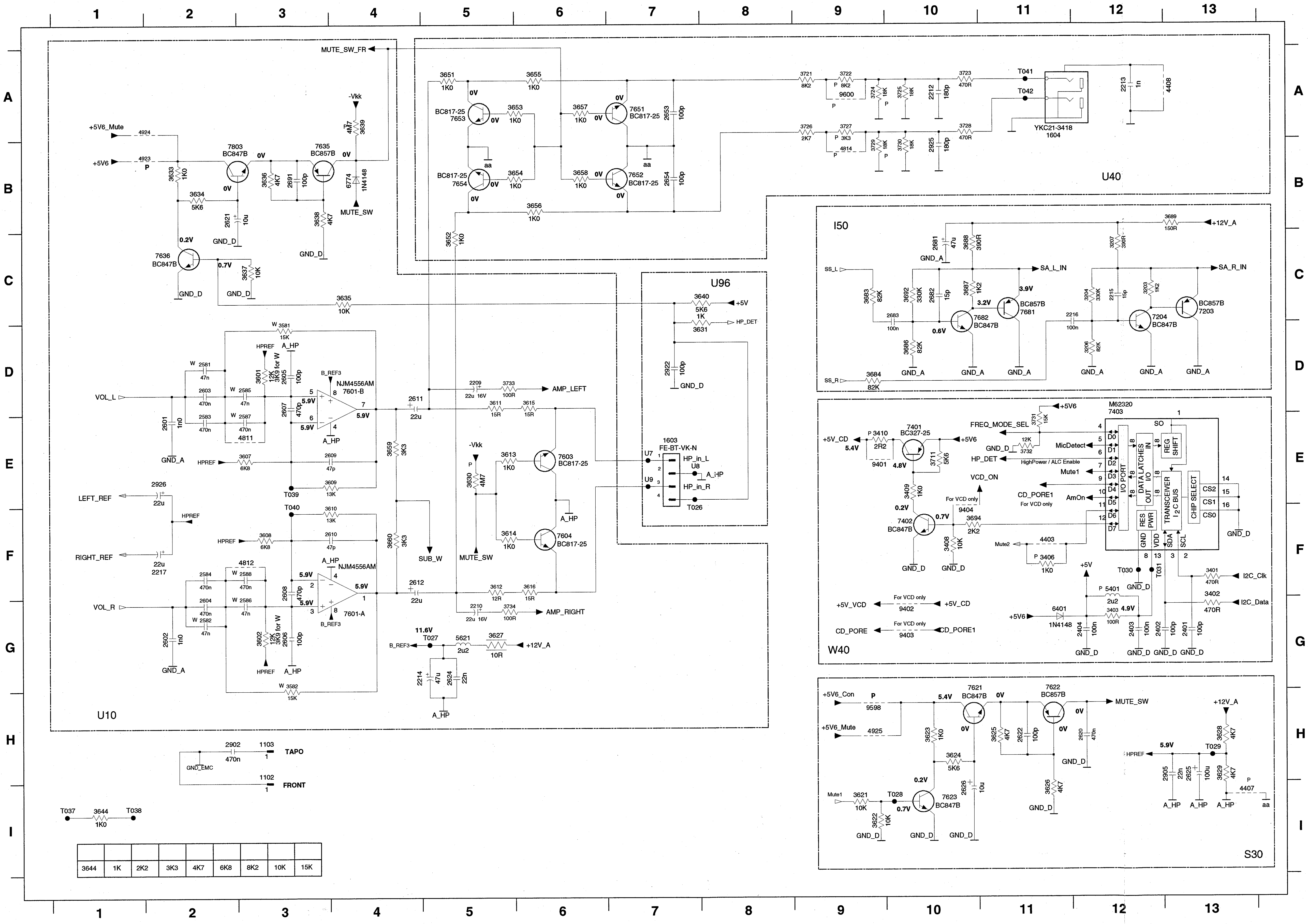
1501	E1
1502	D3
1503	F1
1504	H1
1505	E4
1506	A1
1510	F1
1531	C1
1532	C2
1691	B12
1692	I14
2201	B7
2202	C7
2203	D7
2204	C6
2205	C5
2206	C7
2501	E2
2502	E2
2503	D3
2504	E3
2505	F5
2506	F7
2507	E7
2511	A4
2512	B4
2513	A4
2514	B4
2515	F6
2516	F7
2521	A4
2522	A4
2523	F6
2524	F6
2531	D4
2532	D4
2533	F6
2534	F7
2535	B3
2536	C3
2541	A8
2542	H8
2543	C9
2544	F9
2546	F9
2547	B10
2548	G10
2565	C9
2567	B9
2568	G9
2589	A10
2590	H9
2591	A10
2592	H10
2593	A11
2594	H10
2641	D13
2642	E13
2661	G2
2662	I2
2663	H2
2664	H2
2665	H2
2666	H2
2667	G1
2669	E1
2696	A14
2697	B14
2698	A12
2707	E11
2708	E12
2904	G1
2908	E12
2921	A12
2923	B1
2924	F5
2927	H13
2928	F13
2929	I14
2930	H14
2933	I14
2934	G14
2935	H14
2936	G13
2937	H13
2938	F13
2939	H13
2940	C3
2941	C3
2942	D11
3201	B6
3202	C6
3208	H14
3435	D3
3436	C3
3437	D3
3438	D4
3501	D1
3502	E1
3503	D2
3504	E2
3505	E2
3506	E2
3507	E3
3508	E3
3511	A3
3512	B3
3513	A3
3514	B3
3521	A3
3522	A3
3523	A3
3524	A3
3525	E6
3526	E7
3531	C2
3532	C3
3533	B3
3534	C3
3543	A9
3544	H8
3545	B9
3546	G8
3547	C9
3548	F8
3549	B9
3550	G9
3591	A10
3592	H9
3593	A11
3594	H10
3641	D14
3642	E14
3643	D12
3645	D11
3646	E11
3661	G3
3662	I3
3663	G3
3664	H3
3665	G1
3666	H1
3667	G3
3668	H3
3669	I3
3690	B14
3699	A13
3700	B13
3707	D12
3708	E12
3712	I3
3735	F12
3736	F12
3737	I13
3932	G11
3933	H13
3934	H11
3935	H11
3936	F13
3937	H11
3938	I11
3939	F13
3940	I11
3941	I11
3942	I11
3943	H13
3944	G13
3945	G14
3946	G13
3947	H13
3948	I14
3949	I14
3950	G14
3951	I13
3952	G13
3953	B8
3954	G8
4501	F5
4641	D14
4642	E14
4813	A12
4920	E1
4922	I4
4925	H4
5403	A1
5404	B1
5522	D6
6201	C6
6202	C6
6641	D13
6642	E13
7201	B6
7501	C8
7661	G2
7662	H2
7663	H3
7693	B13
7694	G12
7695-1	F14
7695-2	H14
9522	D6
9618	A1
9654	B1
T001	C1
T002	C1
T003	C1
T004	C1
T005	D1
T006	D1
T007	E1
T008	E1
T009	E1
T010	F2
T011	F2
T012	H1
T013	H1
T014	H1
T015	A12
T016	B12
T017	E3
T018	E3
T019	E3
T020	B7
T021	C6
T022	D7
T023	B14
T024	I13
T025	I12

AF12 BOARD - CIRCUIT DIAGRAM (PART 2)


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
U50
U60
C96
W96
S96
S30
R96
J96
Q10
1801
YKC21-3416
COAX 1
DIGITAL
OUT
T050
T051
3806
75R
3809
47R
3805
220R
2806
150p
TYPE
5801
4921
GND_EMC
2807
100n
2805
100n
P 4909
P 4910
P 4911
+5V_CD
3804
220R
5802
2u2
T052
2.9V
3808
22K
3802
22K
2810
47p
GND_D
2803
1u
7802
74LVU04D
VCC
GND
2804
100n
3803
560R
2802
1n0
T053
3801
470R
2801
100n
3807
2K2
4801
2809
100n
2808
100n
4906
9662
5662
EH-B
1524
GND_M
FE-BT-VK-N
1522
1523
1525
FROM/TO 3CDC
GND_D
SHIELD
COAX2
COAX1
PORE / DSA_STB
SILD
CD_SH_DATA
SICL
CD_SH_CLK
CD_SH_STR
SW_INFO
+12V_M
GND_M
+5V_CD
CD_RIGHT
GND_A
CD_LEFT
T090
T091
T092
T093
T094
T095
T096
T097
T098
T099
T100
T101
T102
T103
T104
CD_PORE
For VCD version only
4914
+12V_M
6207
1N4003
6208
1N4003
2820
220u
4404
T131
GND_M
+5V_CD
CD_Right
A_CD
CD_Left
3412
1K0
+5V
4.5V
1401
1405
NTC
GND_D
I2C_Data
I2C_Clk
+5V6_Con
+12V_M
+5V6
-Vkk
F1
F2
T112
T113
T114
T115
T130
P 4912
4913
NTC
GND_D
I2C_DATA
I2C_CLK
+5V6_CON
+11V_D
+5V6
-VKK
F1
F2
CD_SH_DATA
CD_SH_CLK
CD_SH_STR
GND_D
SW_INFO
SICL
SILD
DSA_STB/GND_D
SILD
4903
5907
P 4907
9405
GND_D
4908
P 4915
5915
DSA_STB
1201
FE-BT-VK-N
FROM / TO Power Board
T054
T055
T056
T057
T058
T059
T060
AMP_LEFT
LEFT_REF
AMP_RIGHT
RIGHT_REF
AmOn
ERROR_DET
FREQ_MODE_SEL
1n
2955
GND_D
1203
FROM / TO Mains Board
T061
T062
T063
T064
T065
T066
T067
T068
NTC
Low_Pw_Ctrl
Pw_Dn
+5V6_Con
GND_D
F1
F2
1204
EH-B
1202
EH-B
FROM / TO Regulator Board
T070
T071
T072
T073
T074
T75
T76
T77
T78
+12V_A
GND_A
+12V_M
GND_M
+5V6
GND_D
+5V_VCD
GND_D
VCD_ON
For CDR version only
+5V6
4905
+12V_M
-Vkk
3205
5K6
-10V
-32V
-CMOS
6205
BZX79-C10
2207
47u
GND_D
T116
+5V6_Con
1N4148
6776
3810
220R
+5V6_Mute
2956
2u2 50V
FOR DVD ONLY
6775
L7805CV
VIN
VOUT
2208
470n
GND_M
CD_PORE
4802
DSA_STB
For Non-VCD version only
FROM/TO TUNER
TU_STEREO
TU_CLK
TU_DATA
TU_ENAB
+12V_A
TU_Right
GND_A
TU_Left
T105
T106
T107
T108
T109
T110
T111
2954
47n
9486
P
2520
10n
A_TU
2950
470p
2951
470p
2952
100p
2953
470p
FE-BT-VK-N
1520
1402
FE-BT-VK-N
FROM/TO FRONT
TU_STEREO
TU_CLK
TU_DATA
TU_ENAB
Tu_Gnd
SA_L_IN
SA_R_IN
POWER_DOWN
LOW_PWR_CTRL
T117
T118
T119
SA_L_IN
SA_R_IN
Pw_Dn
8.5V
Low_Pw_Ctrl
1100
2901
100n
T122
T123
GND_D
GND_EMC
9483
aa
GND_A
MIC_DET
T120
4904
9904
6204
BZX79-B3V3
GND_D

T75	F1
T76	F1
T77	F1
T78	F1
1100	F6
1201	C1
1202	F1
1203	E1
1204	E1
1401	A9
1402	D9
1405	A9
1520	F6
1522	A6
1523	D6
1524	A5
1525	B6
1801	B1
2207	D3
2208	D5
2520	E7
2801	B4
2802	C3
2803	B3
2804	B3
2805	B2
2806	B2
2807	B1
2808	B4
2809	B4
2810	A4
2820	C5
2901	F6
2950	E7
2951	E7
2952	E7
2953	E7
2954	E6
2955	D1
2956	F3
3205	D2
3412	A8
3801	B4
3802	A4
3803	B3
3804	A3
3805	B2
3806	A1
3807	B4
3808	A3
3809	B2
3810	F3
4404	C5
4801	B4
4802	E4
4903	B8
4904	F7
4905	D3
4906	A5
4907	C8
4908	C8
4909	A3
4910	A3
4911	A4
4912	B8
4913	B8
4914	B6
4915	C8
4921	C1
5662	B5
5801	B2
5802	A3
5907	C8
5915	C8
6204	F7
6205	D3
6207	B5
6208	C5
6775	D4
6776	F2
7802	A3
9405	C8
9483	F6
9486	E7
9662	B5
9904	F7
T050	B1
T051	B1
T052	A3
T053	C4
T054	C1
T055	C1
T056	C1
T057	C1
T058	C1
T059	D1
T060	D1
T061	D1
T062	D1
T063	D1
T064	D1
T065	E1
T066	E1
T067	E1
T068	E1
T070	E1
T071	E1
T072	F1
T073	F1
T074	F1
T090	A7
T091	B7
T092	B7
T093	B7
T094	B7
T095	B7
T096	B7
T097	C7
T098	C7
T099	C7
T100	C7
T101	C7
T102	D7
T103	D7
T104	D7
T105	D6
T106	D6
T107	E6
T108	E6
T109	E6
T110	E6
T111	E6
T112	A8
T113	A8
T114	A8
T115	A8
T116	E2
T117	E8
T118	E8
T119	E8
T120	F7
T122	F6
T123	F6
T130	B8
T131	C5

AF12 BOARD - CIRCUIT DIAGRAM (PART 3)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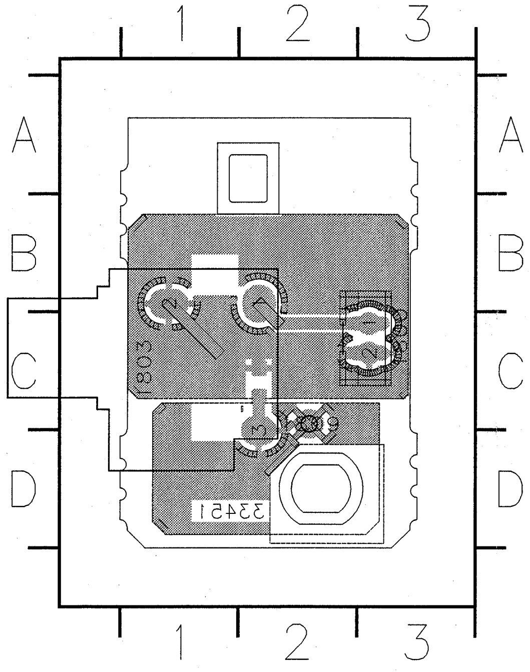
11
12
13
A
B
C
D
E
F
G
H
I
U10
U40
U96
I50
W40
S30
MUTE_SW_FR
+5V6_Mute
+5V6
4924
4923
P
7803
BC847B
7635
BC857B
-Vkk
3639
4M7
6774
1N4148
MUTE_SW
3633
1K0
3634
5K6
2621
10u
3636
4K7
2691
100p
3638
4K7
7636
BC847B
0.2V
0.7V
0V
3637
10K
GND_D
3635
10K
3651
1K0
3655
1K0
BC817-25
7653
3653
1K0
3657
1K0
7651
BC817-25
2653
100p
BC817-25
7654
3654
1K0
3658
1K0
7652
BC817-25
2654
100p
3656
1K0
3652
1K0
aa
3721
8K2
3722
8K2
9600
3724
18K
3725
18K
2212
180p
3723
470R
T041
T042
2213
1n
4408
YKC21-3418
1604
3726
2K7
3727
3K3
4814
3729
18K
3730
18K
2925
180p
3728
470R
3640
5K6
+5V
1K
3631
HP_DET
2922
100p
GND_D
1603
FE-BT-VK-N
U7
U8
U9
HP_in_L
HP_in_R
A_HP
T026
W 3581
15K
HPREF
A_HP
3601
12K
3K9 for W
2605
100p
B_REF3
NJM4556AM
7601-B
W 2581
47n
2603
470n
W 2585
47n
2583
470n
W 2587
470n
4811
VOL_L
2601
1n0
GND_A
2607
470p
5.9V
2611
22u
2209
22u 16V
3733
100R
AMP_LEFT
3611
15R
3615
15R
3659
3K3
HPREF
3607
6K8
2609
47p
T039
3609
13K
-Vkk
3613
1K0
7603
BC817-25
3630
4M7
2926
22u
LEFT_REF
HPREF
RIGHT_REF
22u
2217
T040
3610
13K
3608
6K8
2610
47p
3660
3K3
SUB_W
MUTE_SW
3614
1K0
7604
BC817-25
4812
2584
470n
W 2588
470n
2604
470n
W 2586
47n
W 2582
47n
NJM4556AM
7601-A
VOL_R
2608
470p
2612
22u
3612
12R
3616
15R
2210
22u 16V
3734
100R
AMP_RIGHT
2602
1n0
3602
12K
3K9 for W
2606
100p
W 3582
15K
11.6V
T027
B_REF3
5621
2u2
3627
10R
+12V_A
2214
47u
2624
22n
2902
470n
1103
TAPO
GND_EMC
1102
FRONT
T037
3644
1K0
T038
3689
150R
+12V_A
2681
47u
3688
390R
3207
390R
SS_L
SA_L_IN
SA_R_IN
3683
82K
3692
330K
2682
15p
3687
1K2
3.9V
BC857B
7681
3204
330K
2215
15p
3203
1K2
BC857B
7203
2683
100n
7682
BC847B
3.2V
0.6V
2216
100n
7204
BC847B
3686
82K
3206
82K
GND_A
SS_R
3684
82K
+5V6
3731
15K
FREQ_MODE_SEL
M62320
7403
+5V_CD
5.4V
P 3410
2R2
9401
7401
BC327-25
4.8V
+5V6
3732
12K
3711
5K6
MicDetect
HP_DET
HighPower / ALC Enable
Mute1
VCD_ON
CD_PORE1
For VCD only
AmOn
9404
3409
1K0
0.2V
7402
BC847B
0.7V
3694
2K2
3408
10K
Mute2
4403
P 3406
1K0
+5V
T030
T031
SO
D0
D1
D2
D3
D4
D5
D6
D7
I/O PORT
DATA LATCHES OUT I/O
REG SHIFT IN
TRANSCEIVER I2C BUS
CHIP SELECT
CS2
CS1
CS0
RES PWR
GND
VDD
SDA
SCL
3401
470R
I2C_Clk
3402
470R
I2C_Data
+5V_VCD
9402
+5V_CD
CD_PORE
9403
CD_PORE1
P 5401
2u2
4.9V
3403
100R
6401
1N4148
2404
100n
2403
100n
2402
100p
2401
100p
+5V6_Con
9598
5.4V
7621
BC847B
7622
BC857B
MUTE_SW
+12V_A
+5V6_Mute
4925
3623
1K0
3625
4K7
2622
100p
2620
470n
3628
4K7
HPREF
5.9V
T029
3624
5K6
2905
22n
2625
100u
3629
4K7
P
4407
0.2V
2626
10u
3626
4K7
Mute1
3621
10K
T028
7623
BC847B
3622
10K
A_HP
aa

3644	1K	2K2	3K3	4K7	6K8	8K2	10K	15K

U7	E7
U8	E7
U9	E7
1102	H3
1103	H3
1603	E7
1604	A11
2209	D5
2210	G5
2212	A10
2213	A12
2214	G4
2215	C12
2216	C12
2217	F2
2401	G13
2402	G12
2403	G12
2404	G12
2581	D2
2582	G2
2583	E2
2584	F2
2585	D3
2586	G3
2587	E3
2588	F3
2601	E2
2602	G2
2603	D2
2604	G2
2605	D3
2606	G3
2607	D3
2608	F3
2609	E4
2610	F4
2611	D4
2612	F4
2620	H12
2621	B2
2622	H11
2624	G5
2625	H13
2626	I10
2653	A7
2654	B7
2681	C10
2682	C10
2683	C10
2691	B3
2902	H2
2905	H13
2922	D7
2925	B10
2926	E2
3203	C12
3204	C12
3206	D12
3207	C12
3401	F13
3402	F13
3403	G12
3406	F11
3408	F10
3409	E10
3410	E9
3581	D3
3582	G3
3601	D3
3602	G3
3607	E3
3608	F3
3609	E4
3610	F4
3611	D5
3612	F5
3613	E5
3614	F5
3615	D6
3616	F6
3621	I9
3622	I9
3623	H10
3624	H10
3625	H11
3626	I11
3627	G5
3628	H13
3629	H13
3630	E5
3631	D8
3633	B2
3634	B2
3635	C4
3636	B3
3637	C3
3638	B3
3639	A4
3640	C8
3644	I1
3651	A5
3652	C5
3653	A6
3654	B6
3655	A6
3656	B6
3657	A6
3658	B6
3659	E4
3660	F4
3683	C9
3684	D9
3686	D10
3687	C10
3688	C10
3689	B13
3692	C10
3694	F10
3711	E10
3721	A9
3722	A9
3723	A10
3724	A9
3725	A10
3726	A9
3727	A9
3728	A10
3729	B9
3730	B10
3731	E11
3732	E11
3733	D5
3734	G5
4403	F11
4407	I13
4408	A13
4811	E3
4812	F3
4814	B9
4923	B2
4924	A2
4925	H9
5401	F12
5621	G5
6401	G11
6774	B4
7203	C13
7204	C12
7401	E10
7402	F10
7403	D12
7601-A	G4
7601-B	D4
7603	E6
7604	F6
7621	H10
7622	G11
7623	I10
7635	B3
7636	C2
7651	A7
7652	B7
7653	A5
7654	B5
7681	C11
7682	C10
7803	B3
9401	E9
9402	G10
9403	G10
9404	F10
9598	H9
9600	A9
T026	F7
T027	G5
T028	I10
T029	H13
T030	F12
T031	F12
T037	I1
T038	I1
T039	E3
T040	F3
T041	A11
T042	A11

VIDEO OUT CINCH BOARD - COMPONENT LAYOUT

1800 C3 1803 C1 1809 C2


1
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A
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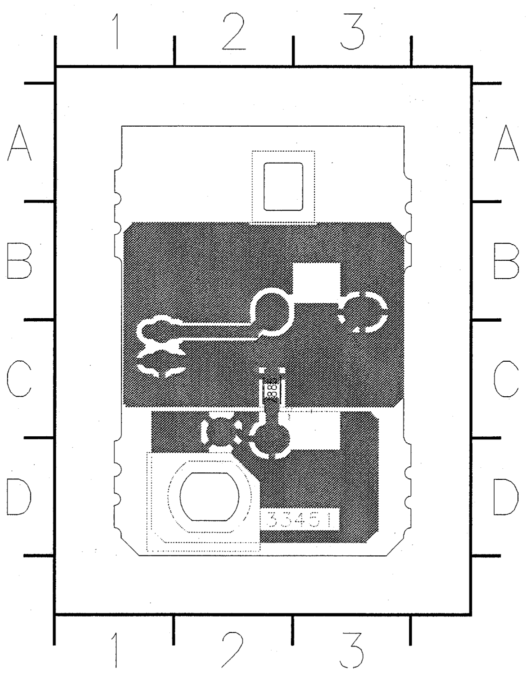
D
1803
33451

VIDEO OUT CINCH BOARD - CHIP LAYOUT

2885 C2


1
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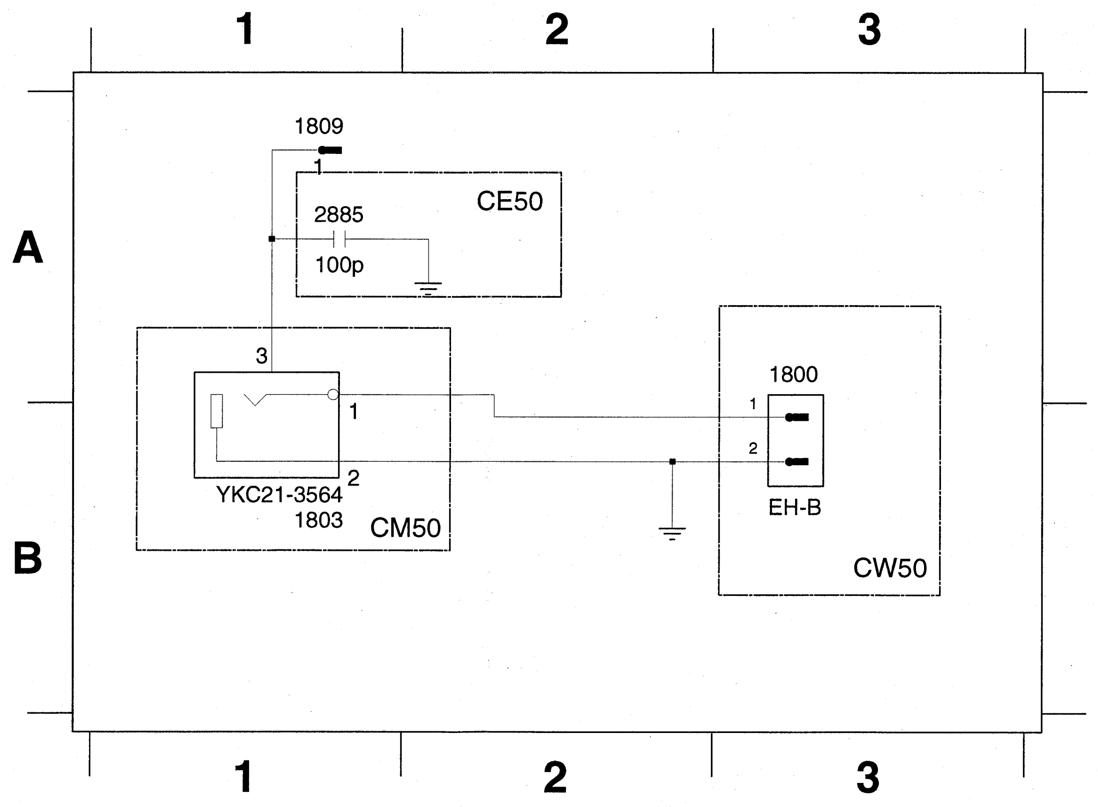
33451

VIDEO OUT CINCH BOARD - CIRCUIT DIAGRAM

1800 A3 1803 B1 1809 A1 2885 A1

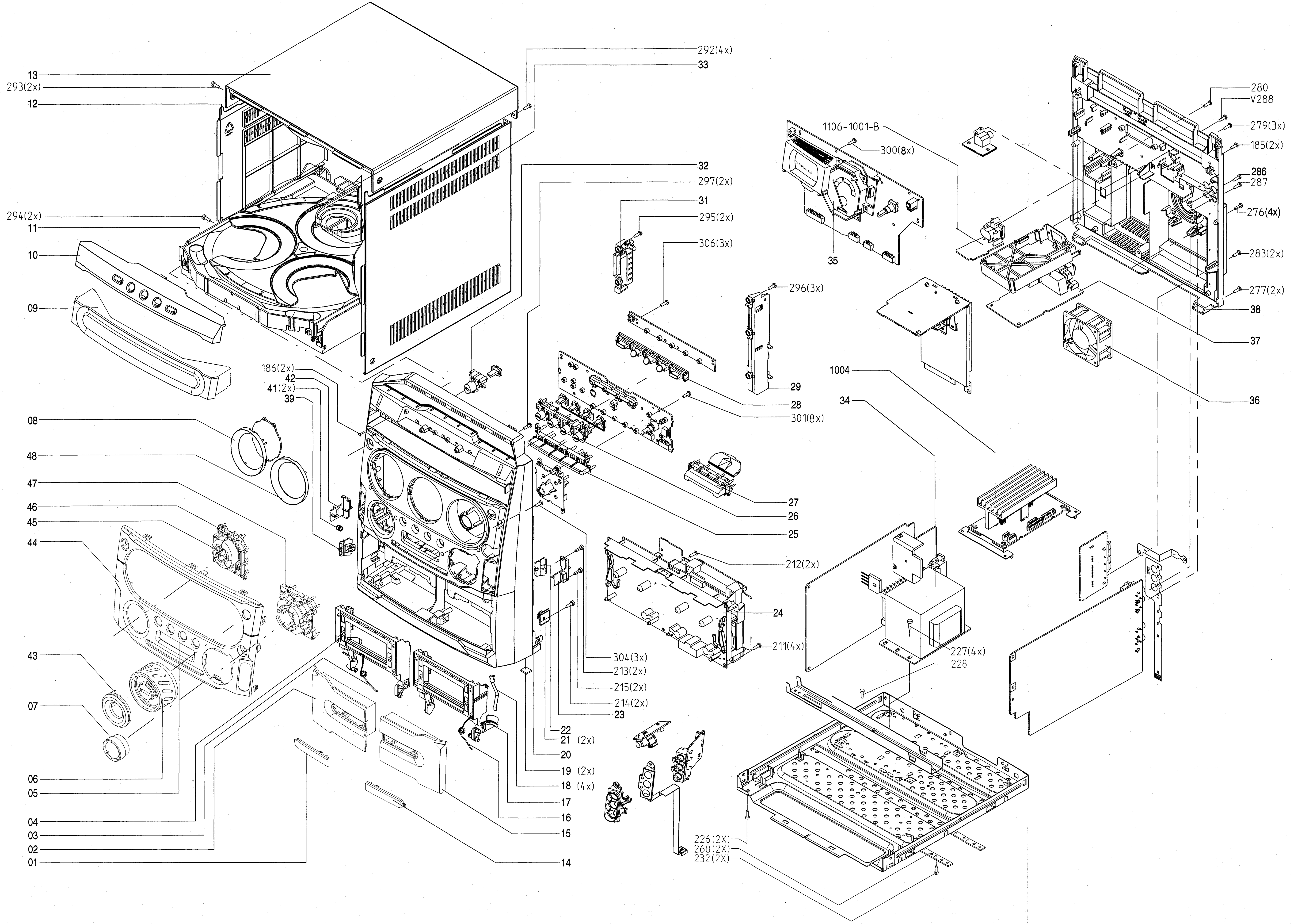

1
2
3
A
B
1809
1
CE50
2885
100p
3
1
2
YKC21-3564
1803
CM50
1800
1
2
EH-B
CW50

ELECTRICAL PARTS - AF12 BOARD

1501	996500014506	SOC CINCH H 2P
1504	996500014506	SOC CINCH H 2P
1803	994000001852	SOC CINCH H 1P
3627	⚠ 996500018242	FUSE RES NFR 25A 10R
7403	482220917345	IC M62320FP
7501	932215074668	IC TDA7468D
7601	532220915853	IC NJM4556AM-TE1
7694	532220911102	IC HEF4052BT
7695	482220983357	IC NJM4560M

Note: **Only these parts mentioned in the list are normal service parts.**

SET MECHANICAL EXPLODED VIEW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294(2x)
11
10
09
08
48
47
46
45
44
43
07
06
05
04
03
02
01
186(2x)
42
41(2x)
39
292(4x)
33
32
297(2x)
31
295(2x)
306(3x)
296(3x)
29
28
301(8x)
27
26
25
212(2x)
24
211(4x)
304(3x)
213(2x)
215(2x)
214(2x)
23
22
21 (2x)
20
19 (2x)
18 (4x)
17
16
15
14
1106-1001-B
300(8x)
35
280
V288
279(3x)
185(2x)
286
287
276(4x)
283(2x)
277(2x)
38
37
36
1004
34
227(4x)
228
226(2X)
268(2X)
232(2X)

MECHANICAL & ACCESSORIES

1	994000001825	LENS CASSETTE LEFT
2	994000001823	COVER CASS LEFT
3	994000001849	SPRING TORSION LEFT
4	994000001821	CASS DOOR LEFT
6	994000001827	KNOB VOL MASTER
7	994000001832	KNOB RTY (GAME SOUND)
8	994000001839	COVER RING FTD
9	994000001815	COVER TRAY CDC
10	994000001814	PANEL COVER CDC DISC
10	994000001814	PANEL COVER CDC DISC /22
11	994000002248	PANEL COVER CDC DISC /07
12	994000001818	PANEL LEFT
13	994000001817	COVER TOP
14	994000001826	LENS CASSETTE RIGHT
15	994000001824	COVER CASS RIGHT
16	994000001851	SPRING TORSION RIGHT
17	994000001822	CASS DOOR RIGHT
18	482249242787	SPRING CASSETTE
19	994000001848	FOOT RUBBER 4mm
20	994000001812	FRONT CAB.
21	994000001843	DAMPER ASSY MODULE 0.8
22	994000001846	PUSH-CATCH RIGHT
23	994000001844	BRACKET-RIGHT
25	994000001838	BUTTON CASSETTE
26	994000001837	BUTTON SOURCE (WOOX)
27	994000001836	BUTTON MAX-WOOX
28	994000001831	BUTTON SET CDC SELECT
29	313911470980	BRACKET CDC RIGHT
31	313911470970	BRACKET CDC LEFT
32	994000001829	BUTTON POWER STANDBY
33	994000001819	PANEL RIGHT
34	⚠ 994000001794	TRAFO MAINS UCD 240W/22
34	⚠ 994000002246	TRAFO MAINS UCD 110W/07
35	994000001796	METER VU FOR MINI404
36	994000001795	FAN 12V DC 0.8W
38	994000001816	BACK PANEL
39	994000001847	PUSH CATCH LEFT
41	482249242787	SPRING COMPRESSION
42	994000001845	BRACKET-LEFT
43	994000001828	CAP KNOB VOL PNT
44	994000001813	PANEL FRONT DISPLAY /22
44	994000002247	PANEL FRONT DISPLAY /07
45	994000001835	BUTTON CONTROL PLAY(1)
46	994000001834	BUTTON CONTROL (2)
47	994000001833	BUTTON DSC/DBB/VAC
48	994000001842	COVER RING VU METER

994000001811	L/R BOX SPK ASSY /22
994000002827	L/R BOX SPK ASS'Y /07
994000001786	FM AERIAL /22
994000002828	FM ANT 300R CABLE 2.6M /07
994000001787	ANT AM LOOP LAN-006 /22
994000001192	AM LOOP ANT LAN-031 /07
994000001788	REMOTE CONTROL /22
994000002826	REMOTE CONTROL /07
⚠ 994000001789	AC CORD /22
⚠ 994000001688	AC CORD SET 6FT /07
994000001025	CD DA12T3 ASSY
994000001315	RCA PLUG CORD 1P 1M5 /07
994000001791	CBLE CINCH/1M7/CINCH /22

Note: Only these parts mentioned in the list are normal service parts.

ELECTRICAL PARTS - MISCELLANEOUS

994000001797	FFC FOIL 04P/180/04P
994000001798	FFC FOIL 06P/080/06P
994000001799	FFC FOIL 07P/180/07P
994000001801	FFC FOIL 07P/180/07P
994000001802	FFC FOIL 07P/220/07P
994000001803	FFC FOIL 08P/180/08P
994000001804	FFC FOIL 08P/280/08P
994000001805	FFC FOIL 08P/280/08P
994000001806	FFC FOIL 09P/280/09P
994000001807	FFC FOIL 11P/180/11P
994000001808	FFC FOIL 15P/180/15P
994000001809	FFC FOIL 19P/280/19P
994000001922	TUNER BOARD ASS`Y /22
994000002245	TUNER BOARD ASS`Y /07
994000001915	MAIN BOARD ASS`Y
994000001916	FRONT BOARD ASS`Y /22
994000002243	FRONT BOARD ASS`Y /07
994000001917	KEY BOARD ASS`Y
994000001918	AMP BOARD ASS`Y
994000001919	MAINS UCD BOARD ASS`Y /22
994000002244	MAINS UCD BOARD ASS`Y /07
994000001921	REGULATOR BOARD ASS`Y
994000001923	SPEAKER BOARD ASS`Y

Note: Only these parts mentioned in the list are normal service parts.

REVISION LIST

Version 1.0 (3141 785 30180)
* Initial Release FWM70/22

Version 1.1 (3141 785 30181)
* Add FWM70/07 information,
    1) Page 1-2 Version Variations add /07 version
    2) Page 1-3 Specifications add /07 version.
    3) Page 8-13 and page 12-2 partslist adapted.
    4) Chapter 7A - ECO6 Non Cenelec have been added.